

POWERTECH (USA) INC.

APPENDIX 3.5-A

SUBMITTED METHODOLOGY

6.0 VEGETATION BASELINE STUDIES

6.1 INTRODUCTION

The baseline vegetation study will cover the Dewey-Burdock permit area. The project area may contain all or some of the following four native vegetation community types: upland grassland, ponderosa pine woodland, riparian, and wetland. Field work was conducted in the summer of 2007. Table 6-1 shows the mapping acreages.

Table 6-1. Vegetation Map Units and Associated Acreages

Vegetation Map Units	Proposed Permit Area Acreage
Upland Grassland	To be determined
Ponderosa Pine Woodland	
Riparian	
Wetland	
Total	**9,400**

Vegetation baseline study monitoring will be conducted using the procedures described in this document. Vegetation parameter sampling will be conducted by vegetation community type as specified in Table 6-2. For purposes of this methodology, "project area" will be the same as "study or permit area."

Table 6-2. Vegetation Baseline Sampling—Measured Parameters

Parameter	Upland Grassland	Ponderosa Pine Woodland	Riparian	Wetland[a]
% Absolute Total Ground Cover	Yes	Yes	Yes	No
First Hit % Absolute Total Vegetation Cover	Yes	Yes	Yes	No
Multiple Hit Vegetation	Yes	Yes	Yes	No
Shrub/Subshrub Density	Yes	Yes	Yes	No
Production	No	No	No	No
Tree Count and Distribution	No	Yes	No	No

(a) Wetlands will not be sampled as part of the baseline study but will be included under U.S. Army Corps of Engineers (US ACE) delineation requirements.

6.2 VEGETATION COMMUNITY CLASSIFICATION AND MAPPING

The baseline project area will be classified and mapped before commencing vegetation sampling. Preliminary mapping and classification, based on aerial photography, has identified the four following plant communities:

1. Upland grassland
2. Ponderosa pine woodland
3. Riparian
4. Wetland.

Plant communities will be further mapped using color infra-red (CIR) aerial photography and verified through field survey. Disturbed areas within the project will also be identified and mapped, if possible, based on the scale of available mapping. Disturbed areas will be excluded, however, from all vegetation parameter sampling. All areas within ½ mile of the project area will be mapped, based on a review of CIR aerial photography and known expression of photography within the project area. It will not be necessary to field verify this mapping within a ½ mile nor will vegetation sampling be conducted.

6.3 TRANSECT ORIGIN SELECTION

A computerized systematic grid (through **AutoCAD** or **ArcGIS**) will be used to randomly locate sample points within each vegetation community. These computer-generated random numbers will be uploaded to a hand-held GPS unit for actual location in the field. Sample points will be sampled in numerical order until the minimum sample size is attained and then until either sample adequacy is met or the required maximum number of samples is collected.

6.4 LINE TRANSECT LAYOUT

A 50-meter line transect will be used in the three vegetation communities to be sampled; i.e., upland grassland, ponderosa pine woodland, and riparian. Each 50-meter line transect will begin at its specified random origin point and extend in a randomly generated compass direction.

Transects that exceed the boundaries of the vegetation community being sampled will be redirected back into its vegetation community at a 90-degree angle from the original transect direction at the point of intercept. In instances where a 90-degree angle of reflection does not place the transect within the sampled community, a 45-degree angle of reflection will be used.

6.5 GROUND COVER

Line-transect point-intercept methods will be used to collect percent absolute cover data from the three vegetation communities. In the upland grassland, ponderosa pine woodland, and riparian communities, each 50-meter transect will represent a single sample point. Percent cover measurements will be taken from point-intercepts at 1-meter intervals along a 50-meter transect using a laser pointer. Should a transect run out of the vegetation community boundary or a nonvegetated feature, it will be redirected as described above. Each point-intercept will represent 2 percent toward cover measurements.

Percent cover measurements will record "first-hit" point-intercepts by live foliar vegetation species, litter, rock, or bare ground. Litter will include all organic material that is dead, including manure. Rock fragments will be recorded when they are equal to or greater than 2 centimeters in size (i.e., sheet flow, minimum nonerodible particle size). First-hit data will be recorded and tabulated to evaluate total ground cover and total vegetation cover. Multiple hits on vegetation will be recorded but used only for the purpose of constructing a plant species list for each plant community. Total ground cover is the sum of cover values for percent vegetation, percent litter, and percent rock.

6.6 TOTAL VEGETATION COVER

Vegetation cover data will be recorded by species using first-hit data. All point intercepts of living vegetation and growth produced during the current growing season will be counted toward total vegetation cover. Total vegetation cover measurements will be expressed in absolute percentages for each sample point. Relative cover values for percent species cover will be provided. Percent vegetation cover is the vertical projection of the general outline of plants to the ground surface. Total vegetation cover will include moss.

6.7 TOTAL GROUND COVER

Total ground cover data will be recorded by live vegetation, litter, rock, or bare ground. Litter will include all dead organic matter and manure that is recognizable as well as lichen and moss. Total ground cover measurements will be expressed in absolute percentages for each sample point.

6.8 SPECIES DIVERSITY

The total number of plant species within a 1×50-meter belt transect will be summarized for each vegetation type.

6.9 PRODUCTION

No production sampling will be necessary for the 2007 baseline vegetation assessment.

6.10 SHRUB DENSITY

Shrub density data will be collected in conjunction with randomly selected cover transects, wherever possible. All shrubs; full, half, or sub, will be counted within 50 centimeters on either side of the 50-meter cover transect (1-meter×50-meter belt transect). Sample adequacy will not be calculated on shrub density transects; however, shrub density data will be qualitatively evaluated. The number of belt transects will equal the number of cover transects for a given vegetation type. No shrub height measurements will be collected.

6.11 TREE DENSITY

Within the ponderosa pine woodland vegetation community, tree density will be estimated by gridding the aerial photograph for the project area and counting the number of ponderosa pine per unit area, based on a small number of randomly selected grid intervals. In addition, a range of age distribution will be determined using nondestructive techniques, such as correlating known measures of age and height, or age and diameter at breast height (DBH), or ring counts from recent timber harvest stumps and logs.

Within other vegetation communities, individual ponderosa pine or other tree species found will be directly counted for numbers. Height and DBH may be more appropriate in these vegetation types based on lack of downed timber, such as is present in the ponderosa pine woodland.

6.12 SAMPLE ADEQUACY

A minimum of 20 cover transects per vegetation type will be sampled in upland grassland, ponderosa pine woodland, and riparian communities. Sample adequacy will be calculated and an incremental number of cover transects will be sampled up to the maximum of 50.

Minimum and maximum sample sizes are listed in Table 6-3. The following sample adequacy formula will be utilized to determine the minimum required size of the sample population:

$$n_{min} \geq \frac{2(sz)^2}{(dx)^2} \qquad (6\text{-}1)$$

where:

n_{min} = minimum number of sampled line transects needed to adequately represent native vegetation types

s = sample standard deviation

z = the z statistic

d = the amount of reduction desired

x = sample mean for cover.

Table 6-3. Vegetation Monitoring Minimum/Maximum Sample Population Requirements for Upland Grassland, Ponderosa Pine Woodland, and Riparian Communities

Vegetation Community	Parameter	Sample Size	
		Minimum	Maximum
Upland Grassland	Ground Cover	20	50
	Vegetation Cover		
	Shrub Density		
Ponderosa Pine Woodland	Ground Cover	20	50
	Vegetation Cover		
	Shrub Density		
Riparian	Ground Cover	20	50
	Vegetation Cover		
	Shrub Density		
	Vegetation Cover		
	Shrub Density		
Total		**60**	**150**

The three vegetation communities have been identified as "grassland" or "shrubland." Upland grassland is identified as grassland while the ponderosa pine woodland and riparian communities are identified as shrublands. The constant values to be used in statistical test are: z=1.28 and d=0.1 for grasslands. The shrubland values are z=0.84 and d=0.2. All sampled vegetation will be included in the sample adequacy test (i.e., "undesirable" species will not be eliminated from the equation).

6.13 PLANT SPECIES LIST

A vegetation species list by scientific name, common name, and lifeform will be developed individually for each of the three vegetation communities. This list will be compiled from species noted during all vegetation monitoring activities, including point-intercept line transect cover measurements and other opportunistic observations of the sampling area.

6.14 OTHER DATA COLLECTED

Any United States Fish and Wildlife Service (US FWS) threatened or candidate species or any state species of special concern listed in the South Dakota Natural Heritage database will be surveyed and any known location identified on the map. Table 6-4 lists the threatened and candidate species along with their habitat and flowering dates. Table 6-5 lists the species of special concern along with their habitats and flowering dates. All state-listed noxious weed will be noted and significant concentrations identified on the vegetation baseline report map.

Photographs will be taken of the vegetation communities. Photographic locations will be documented and illustrated on a map.

6.15 EXTENDED REFERENCE AREA MAPPING AND JUSTIFICATION

As noted in the Vegetation Community Classification and Mapping section (Section 6.2), all lands within the project area are to be mapped as one of three plant community types. Upland grassland, ponderosa pine woodland, and riparian areas unaffected by the mining operation will serve as an Extended Reference Area (EXREFA). Wetlands will not be sampled under baseline evaluation but included in US ACE delineation. For the purposes of this study, EXREFA means a native land unit which will be used to evaluate revegetation success for each of the same native plant communities which was affected by the mining operation. The EXREFA will be a subset of the mapped native communities and will be included as potential sample points for the cover sampling program. The EXREFA will remain unaffected over the course of the mining operation and will be as large as practical, at least 2 acres, considering land ownership patterns and land management history. The permit application will show the EXREFA on the vegetation map and will include text justifying the choice of the EXREFA.

Table 6-4: Threatened and Candidate Species to Be Sampled

Scientific Name	Common Name	Flowering Date	Habitat	Classification
Botrychium campestre	Prairie Moonwort	May–Early June	Dry prairies and sand dunes, as well as sandy, dry disturbed sites, such as roadsides and old fields	Not ranked (under review)
Botrychium lineare	Moonwort Grape-Fern	May–Early June	Meadows with tall grasses and forbs, beneath trees in wooded areas, on north-facing limestone cliff shelves, and in streamside edges	Not ranked
Botrychium multisided	Leathery Grape-fern	May–Early June	Savannah, prairie, meadow, field	Not ranked (under review)
Carex alopecoidea	Tawny Sedge	July	Seasonally saturated soils in wet meadows, openings in alluvial woods, stream banks, particularly on calcareous substrates	S2
Cypripedium parviflorum	Lesser Yellow Lady's Slipper	May–June	Bogs, shady swamps, wet woods	Not ranked (under review)
Eleocharis elliptica	Elliptic Spikerush	June–August	Very wet, calcareous (or brackish) shores, pool margins, fens, meadows, prairies	Not ranked
Epipactis gigantea	Stream Orchid	April–July	Ledges, stream, river banks	S1
Lycopodium complanatum	Ground Cedar	Unknown	Dry open coniferous or mixed forest alpine slopes	S1
Platanthera orbiculata	Round-Leaved Orchid	July	Moderate moisture; woods, forests; in rich soil	S2
Salix candida	Sage Willow	April–May	Cold, open fens, swamps and bogs	S1
Salix serissima	Autumn Willow	Unknown	Swamp, marsh, bog, fen, lakeshores	S1
Sanguinaria canadensis	Bloodroot	March–April	Rich, deciduous, upland and floodplain woods	S4
Viburnum opulus var. americana	American Cranberrybush	May–July	Cool woods, thickets, rocky shores, slopes	Not ranked (under review)
Viola selkirkii	Great-Spurred Violet	April–June	Cold areas	S1

Table 6-5. Species of Special Concern to Be Sampled

Scientific Name	Common Name	Flowering Date	Habitat	Classification
Adiantum capillus-veneris	Southern Maidenhair-Fern	June–August	Moist, well-drained sand, loam or limestone	S1
Carex bella	Elegant Sedge	June–August	Moist subalpine meadows	S1
Eleocharis rostellata	Beaked Spikerush	July–September	Saline or alkaline wetlands	S1
Gentiana affinis	Northern Gentian	Unknown	Moist	S2
Listera convallarioides	Broad-Lipped Twayblade	June–August	Moist woods	S1
Lycopodium annotinum	Bristly Clubmoss	Unknown	Swampy or moist coniferous forests, mountain forests, and exposed grassy or rocky sites	S1
Oxyria digyna	Mountain Sorrel	June–September	Gravel bars, mudflats, tundra, scree slopes, crevices in rock outcrops, talus slopes	S1
Petasites sagittatus	Sweet-Coltsfoot	May–June	Wet, forests, meadows	S1
Polystichum lonchitis	Northern Holly-Fern	Unknown	Woodland, rocky bluff	S1
Salix lucida	Shining Willow	April–May	Steam and swamp banks, fens, beaches, met meadows, mud flats	S1

APPENDIX 3.5-B

VEGETATION SPECIES SUMMARY

POWERTECH (USA) INC.

			Vegetation Community				
Code	Scientific Name	Common Name	Big Sagebrush Shrubland	Cottonwood Gallery	Greasewood Shrubland	Ponderosa Pine Woodland	Upland Grassland
Cool Season Perennial Grasses							
AGRCRI	*Agropyron cristatum*	crested wheatgrass	X	X	X		X
BROINE	*Bromus inermis*	smooth brome		X	X		
CARFIL	*Carex filifolia*	threadleaf sedge	X		X	X	X
CARGEY	*Carex geyeri*	Geyer's sedge				X	
CARSTE	*Carex stenophylla*	needleleaf sedge	X		X		
ELYCAN	*Elymus canadensis*	Canada wildrye				X	
ELYCIN	*Elymus cinereus*	basin wildrye			X		
ELYELY	*Elymus elymoides*	bottlebrush squirreltail	X				
ELYHIS	*Elymus hispidus*	intermediate wheatgrass			X		
ELYLAN	*Elymus lanceolatus*	thickspike wheatgrass	X		X	X	
ELYSMI	*Elymus smithii*	western wheatgrass	X	X	X	X	X
ELYTRA	*Elymus trachycaulus*	slender wheatgrass			X		
HESCOM	*Hesperostipa comata*	needleandthread	X			X	X
HORJUB	*Hordeum jubatum*	foxtail barley			X		
KOEMAC	*Koeleria macrantha*	prairie junegrass	X			X	
NASVIR	*Nassella viridula*	green needlegrass			X	X	
SCHPAN	*Schedonnardus panniculatus*	common tumblegrass			X		
PHLALP	*Phleum alpinum*	alpine timothy			X		
POAPRA	*Poa pratensis*	Kentucky bluegrass		X	X	X	
POASEC	*Poa secunda*	Sandberg bluegrass	X		X	X	X
Warm Season Perennial Grasses							
ARISPP	*Aristida* spp.	Threeawn	X		X		
ARIPUR	*Aristida purpurea*	purple threeawn	X				X
ARIPUR	*Aristida purpurea var. fendleriana*	Fendler's threeawn				X	
BOUCUR	*Bouteloua curtipendula*	sideoats grama	X			X	X
BOUGRA	*Bouteloua gracilis*	blue grama	X		X	X	X
BUCDAC	*Buchloe dactyloides*	buffalograss	X		X	X	X
DISSTR	*Distichlis stricta*	inland saltgrass		X	X		
SCHSCO	*Schizachyrium scoparium*	little bluestem	X			X	
SPOAIR	*Sporobolus airoides*	alkali sacaton			X		
SPOCRY	*Sporobolus cryptandrus*	sand dropseed			X		
	Species observed but not sampled						

			Vegetation Community				
Code	Scientific Name	Common Name	Big Sagebrush Shrubland	Cottonwood Gallery	Greasewood Shrubland	Ponderosa Pine Woodland	Upland Grassland
Warm Season Perennial Grasses continued							
PANVIR	*Panicum virgatum*	switchgrass	X	X	X		X
Annual Grasses							
BROJAP	*Bromus japonicus*	Japanese brome	X	X	X	X	X
BROTEC	*Bromus tectorum*	cheatgrass	X	X	X	X	X
HORPUS	*Hordeum pusillum*	little barley	X		X		X
VULOCT	*Vulpia octoflora*	sixweeks fescue			X		X
Annual Forbs							
ALYDES	*Alyssum desertorum*	desert alyssum	X		X	X	X
ATRPAT	*Atriplex patula*	spear saltbush	X		X		X
BASSIE	*Bassia sieversiana*	summer cypress		X	X		
BORAGE	*Boraginaeceae* spp.	borage species	X		X	X	
CAMMIC	*Camelina microcarpa*	littleseed falseflax	X		X		X
CHEALB	*Chenopodium album*	lambsquarters goosefoot	X	X	X	X	
CHEBER	*Chenopodium berlandieri*	pitseed goosefoot	X	X	X	X	
CHELEP	*Chenopodium leptophyllum*	narrowleaf goosefoot	X				
CHOTEN	*Chorispora tenella*	crossflower		X		X	
CRYSPP	*Cryptantha* spp.	cryptantha	X		X		
DESPIN	*Descurainia pinnata*	pinnate tansymustard	X	X	X	X	
DESSOP	*Descurainia sophia*	flixweed tansymustard	X	X	X	X	
DRANEM	*Draba nemorosa*	yellow draba			X	X	X
GERVIS	*Geranium viscosissimum*	sticky purple geranium				X	
HEDHIS	*Hedeoma hispidum*	rough false pennyroyal	X		X	X	X
HELANN	*Helianthus annuus*	annual sunflower				X	
LAPRED	*Lappula redowski*	beggars-tick	X	X	X	X	
LEPDEN	*Lepidium densiflorum*	prairie peppergrass	X		X	X	X
LEPPER	*Lepidium perfoliatum*	clasping peppergrass			X		X
LINAUS	*Linum australe*	southern flax	X				X
LINPUB	*Linum puberulum*	plains flax	X				
LUPUS	*Lupinus pusillus*	rusty lupine	X				
MICGRA	*Microsteris gracilis*	slender phlox				X	
	Species observed but not sampled						

			Vegetation Community				
Code	Scientific Name	Common Name	Big Sagebrush Shrubland	Cottonwood Gallery	Greasewood Shrubland	Ponderosa Pine Woodland	Upland Grassland
Annual Forbs continued							
MONUT	*Monolepis nuttalliana*	Nuttall's povertyweed	X		X		
OROMUL	*Orobanche multiflora*	manyflower broomrape	X				
PLAPAT	*Plantago patagonica*	Pursh's plantain	X		X	X	X
POLAVI	*Polygonum aviculare*	prostrate knotweed			X	X	
SALTRA	*Salsola tragus*	Russian thistle		X	X		
SISALT	*Sisymbrium altissimum*	tumbling hedgemustard	X	X	X		
SOLROS	*Solanum rostratum*	buffalobur nightshade					X
SOLTRI	*Solanum triflorum*	cutleaf nightshade			X		
THLARV	*Thlaspi arvense*	field pennycress	X	X	X	X	X
Biennial Forbs							
IPOAGG	*Ipomopsis aggregata*	scarlet gilia	X				
MELOFF	*Melilotus officinalis*	yellow sweetclover	X		X	X	X
TRADUB	*Tragopogon dubius*	yellow salsify	X		X	X	X
Perennial Forbs							
ACHMIL	*Achillea millefolium*	common yarrow		X			
ALLSPP	*Allium* spp.	onion	X		X		
ALLTEX	*Allium textile*	prairie onion	X		X	X	
AMBPSI	*Ambrosia psilostachya*	western ragweed			X		X
ANTMIC	*Antennaria microphylla*	little-leaf pussytoes	X			X	
ANTPAR	*Antennaria parvifolia*	small-leaf pussytoes				X	
ASCSPE	*Asclepias speciosa*	showy milkweed		X			
CALNUT	*Calochortus nuttallii*	sego mariposalily	X				
CAMROT	*Campanula rotundifolia*	harebell				X	
CERSPP	*Cerastium* spp.	chickweed	X				
CIRCAN	*Circaea canadensis*	broadleaf enchanter's nightshade			X		
CIRARV	*Cirsium arvense*	Canada thistle		X			
CIRSPP	*Cirsium* spp	thistle	X				
COMUMB	*Comandra umbellata*	common bastardtoadflax	X			X	
CONARV	*Convolvulus arvensis*	field bindweed			X		
CRESPP	*Crepis* spp.	hawksbeard	X				
	Species observed but not sampled						

			Vegetation Community				
Code	Scientific Name	Common Name	Big Sagebrush Shrubland	Cottonwood Gallery	Greasewood Shrubland	Ponderosa Pine Woodland	Upland Grassland
Perennial Forbs continued							
DALCAN	*Dalea candida*	white prairie-clover					X
DALENN	*Dalea ennandra*	nineanther prairie-clover				X	
DALPUR	*Dalea purpurea*	purple prairie-clover	X				
ECHANG	*Echinacea angustifolia*	purple coneflower					X
EREHOO	*Eremogone hookeri*	Hooker sandwort	X			X	
ERISPP	*Erigeron* spp	fleabane	X			X	
GAISPP	*Gaillardia* spp.	blanketflower				X	
GAUCOC	*Gaura coccinea*	scarlet gaura	X				
GRISQU	*Grindelia squarrosa*	curlycup gumweed	X			X	
HELPAU	*Helianthus pauciflorus*	stiff sunflower					X
HELSPP	*Helianthus* spp.	sunflower	X	X			
HESPUM	*Hesperochiron pumilus*	dwarf hesperochiron	X				
HETVIL	*Heterotheca villosa*	goldenaster	X			X	
LIAPUN	*Liatris punctata*	dotted blazingstar	X			X	
MACSPP	*Machaeranthera* spp.	tansyaster	X				
PEDARG	*Pediomelum argophyllum*	silverleaf scurfpea	X				X
PENSPP	*Penstemon* spp.	penstemon	X			X	
PHLMUL	*Phlox multiflora*	flowery phlox				X	
PHLSPP	*Phlox* spp.	phlox	X		X	X	X
PSOSPP	*Psoralidium* spp.	scurfpea	X				
PSOTEN	*Psoralidium tenuiflorum*	slimflower scurfpea				X	
PTESPP	*Pterospora* spp.	pinedrops				X	
SPHCOC	*Sphaeralcea coccinea*	scarlet globemallow	X		X	X	X
THERHO	*Thermopsis rhombifolia*	prairie thermopsis	X			X	
VICAME	*Vicia americana*	American vetch	X			X	X
WOOORE	*Woodsia oregana var. cathcartiana*	Oregon cliff fern				X	
Perennial Half and Sub-shrubs							
ARTFRI	*Artemisia frigida*	fringed sagewort	X	X	X	X	X
ARTLUD	*Artemisia ludoviciana*	Louisiana sagewort				X	
GUTSAR	*Gutierrezia sarothrae*	broom snakeweed	X			X	X
ROSARK	*Rosa arkansana*	prairie rose				X	
	Species observed but not sampled						

			Vegetation Community				
Code	Scientific Name	Common Name	Big Sagebrush Shrubland	Cottonwood Gallery	Greasewood Shrubland	Ponderosa Pine Woodland	Upland Grassland
Perennial Half and Sub-shrubs continued							
YUCGLA	*Yucca glauca*	yucca (small soapweed)				X	
Perennial Shrubs							
ARTCAN	*Artemisia cana*	silver sagebrush		X	X	X	
ARTTRI	*Artemisia tridentata*	big sagebrush	X	X	X	X	X
CHRVIS	*Chrysothamnus viscidflorus*	Douglas rabbitbrush				X	
ERINAU	*Ericameria nauseosa*	rubber rabbitbrush		X	X	X	
SARVER	*Sarcobatus vermiculatus*	greasewood	X	X	X		
SYMOCC	*Symphoricarpos occidentalis*	western snowberry		X			
Succulents							
CORSPP	*Coryphantha* spp.	ball cactus	X				
OPUPOL	*Opuntia polyacantha*	plains prickly pear	X		X	X	X
PEDSIM	*Pediocactus simpsonii*	mountain ball cactus	X				
Trees							
JUNSCO	*Juniperus scopulorum*	Rocky Mountain juniper				X	
PINPON	*Pinus ponderosa*	ponderosa pine				X	
POPDEL	*Populus deltoides*	plains cottonwood		X			
Lichens and Moss							
LICSPP	*Lichen* spp.	lichen	X		X	X	X
MOSSPP	*Moss* spp.	moss			X	X	
	Species observed but not sampled						

APPENDIX 3.5-C

VEGETATION COVER SUMMARIES

POWERTECH (USA) INC.

POWERTECH (USA) INC
DEWEY-BURDOCK PROJECT
Report: Cover Summary

Site Id: BS
Name: Baseline
Comm. Type/Form: Big Sagebrush
Sample Date:7-2-2007 to 7-12-2007

Sample Method: Point Intercept
Sample Size: 50 Meter Transect
Number of Samples: 27
Report Date: 1-14-08

Species	Cover Mean Absolute	Cover Relative (%)	Std. Dev. n-1	Frequency Absolute	Frequency Relative (%)	I.V.	Rank
Cool Season Perennial Grasses							
Carex filifolia	3.56	7.76	6.14	48.15	7.39	15.14	5
Carex stenophylla	0.07	0.15	0.38	3.70	0.57	0.72	15
Elymus lanceolatus	0.07	0.15	0.38	3.70	0.57	0.72	15
Elymus smithii	3.78	8.24	3.82	70.37	10.80	19.03	4
Hesperostipa comata	0.89	1.94	2.03	18.52	2.84	4.78	11
Poa secunda	0.96	2.09	2.03	25.93	3.98	6.07	8
Sub-total	9.33	20.33					
Warm Season Perennial Grasses							
Aristida purpurea	0.15	0.33	0.53	7.41	1.14	1.46	15
Bouteloua curtipendula	0.22	0.48	0.85	7.41	1.14	1.62	14
Bouteloua gracilis	11.19	24.38	7.45	88.89	13.64	38.02	1
Buchloe dactyloides	9.63	20.98	10.47	77.78	11.93	32.92	2
Panicum virgatum	0.07	0.15	0.38	3.70	0.57	0.72	15
Sub-total	21.26	46.33					
Annual Grasses							
Bromus japonicus	2.81	6.12	3.56	55.56	8.52	14.65	6
Bromus tctorum	1.85	4.03	2.98	40.74	6.25	10.28	7
Sub-total	4.66	10.15					
Annual Forbs							
Alyssum desertorum	0.22	0.48	0.85	7.41	1.14	1.62	14
Camelina microcarpa	0.07	0.15	0.38	3.70	0.57	0.72	15
Hedeoma hispidum	0.07	0.15	0.38	3.70	0.57	0.72	15
Lappula redowski	0.07	0.15	0.38	3.70	0.57	0.72	15
Lepidium densiflorum	0.30	0.65	0.72	11.11	1.70	2.36	13
Linum australe	0.07	0.15	0.38	3.70	0.57	0.72	15
Plantago patagonica	0.07	0.15	0.38	3.70	0.57	0.72	15
Sub-total	0.87	1.90					
Perennial Forbs							
Calochortus nuttallii	0.07	0.15	0.38	3.70	0.57	0.72	15
Phlox spp.	0.07	0.15	0.38	3.70	0.57	0.72	15
Sphaeralcea coccinea	0.37	0.81	1.11	11.11	1.70	2.51	12
Sub-total	0.51	1.11					
Perennial Sub-Shrubs							
Artemisia frigada	1.04	2.27	1.25	22.22	3.41	5.68	9
Gutierrezia sarothrae	0.15	0.33	0.27	7.41	1.14	1.46	15
Sub-total	1.19	2.59					
Perennial Shrubs							
Artemisia tridentata	7.26	15.82	5.82	92.59	14.20	30.03	3
Sub-total	7.26	15.82					
Perennial Succulants							
Opuntia polyacantha	0.81	1.77	0.89	22.22	3.41	5.17	10
Sub-total	0.81	1.77					
Total Vegetation	45.89		13.09				
Lichen	1.26		2.30				
Moss	0.07		0.38				
Litter/Rock	38.52		19.27				
Total Ground Cover	85.78		6.59				
Bare Soil	14.07		6.50				
Total Cover	99.85						
Species Abundance (No. of Species/Sample)	27						

POWERTECH (USA) INC
DEWEY-BURDOCK PROJECT
Report: Cover Summary

Site Id: GW
Name: Baseline
Comm. Type/Form: Greasewood Shrubland
Sample Date:7-2-2007 to 7-12-2007

Sample Method: Point Intercept
Sample Size: 50 Meter Transect
Number of Samples: 37
Report Date: 1-14-08

Species	Cover Mean Absolute	Cover Relative (%)	Std. Dev. n-1	Frequency Absolute	Frequency Relative (%)	I.V.	Rank
Cool Season Perennial Grasses							
Agropyron cristatum	0.49	1.32	2.64	5.41	0.97	2.29	15
Bromus inermis	0.22	0.59	0.79	8.11	1.46	2.05	17
Carex filifolia	0.27	0.73	1.07	8.11	1.46	2.18	16
Carex stenophylla	0.11	0.30	0.66	2.70	0.48	0.78	22
Elymus hispidus	0.05	0.13	0.33	2.70	0.48	0.62	23
Elymus lanceolatus	0.22	0.59	1.03	5.41	0.97	1.56	19
Elymus smithii	8.65	23.31	8.47	89.19	16.02	39.33	1
Hordeum jubatum	0.05	0.13	0.33	2.70	0.48	0.62	23
Poa secunda	0.16	0.43	0.73	5.41	0.97	1.40	20
Schedonnardus panniculatus	0.05	0.13	0.33	2.70	0.48	0.62	23
Sub-total	10.27	27.67					
Warm Season Perennial Grasses							
Artistida spp.	0.05	0.13	0.33	2.70	0.48	0.62	23
Bouteloua gracilis	3.84	10.35	6.10	43.24	7.77	18.11	3
Buchloe dactyloides	3.57	9.62	5.97	45.95	8.25	17.87	4
Distichlis stricta	0.97	2.61	3.93	10.81	1.94	4.56	11
Sporobolus airoides	0.54	1.46	1.68	13.51	2.43	3.88	12
Sporobolus cryptandrus	0.05	0.13	0.33	2.70	0.48	0.62	23
Sub-total	9.02	24.31					
Annual Grasses							
Bromus japonicus	0.22	0.59	0.64	10.81	1.94	2.53	14
Bromus tectorum	1.62	4.37	3.43	29.73	5.34	9.71	5
Sub-total	1.84	4.96					
Annual Forbs							
Bassia sieveriana	1.68	4.53	4.15	21.62	3.88	8.41	8
Camelina microcarpa	0.05	0.13	0.33	2.70	0.48	0.62	23
Chenopodium album	0.16	0.43	0.55	8.11	1.46	1.89	18
Chenopodium berlandieri	0.05	0.13	0.33	2.70	0.48	0.62	23
Cryptantha spp.	0.05	0.13	0.33	2.70	0.48	0.62	23
Descurainia pinnata	0.11	0.30	0.46	5.41	0.97	1.27	21
Lappula redowski	0.22	0.59	0.79	8.11	1.46	2.05	17
Lepidium densiflorum	0.16	0.43	0.73	5.41	0.97	1.40	20
Lepidium perfoliatum	0.27	0.73	0.96	8.11	1.46	2.18	16
Monolepis nuttalliana	0.38	1.02	1.14	13.51	2.43	3.45	13
Plantago patagonica	0.65	1.75	1.89	16.22	2.91	4.66	10
Salsola tragus	0.05	0.13	0.33	2.70	0.48	0.62	23
Sub-total	3.83	10.32					
Perennial Forbs							
Ambrosia psilostachya	0.05	0.13	0.33	2.70	0.48	0.62	23
Convolvulus arvensis	0.05	0.13	0.33	2.70	0.48	0.62	23
Sphaeralcea coccinea	0.05	0.13	0.33	2.70	0.48	0.62	23
Sub-total	0.15	0.40					
Perennial Shrubs							
Artemisia cana	0.59	1.59	1.32	18.92	3.40	4.99	9
Artemisia tridentata	1.57	4.23	3.66	24.32	4.37	8.60	7

POWERTECH (USA) INC
DEWEY-BURDOCK PROJECT
Report: Cover Summary

Site Id: GW
Name: Baseline
Comm. Type/Form: Greasewood Shrubland
Sample Date:7-2-2007 to 7-12-2007

Sample Method: Point Intercept
Sample Size: 50 Meter Transect
Number of Samples: 37
Report Date: 1-14-08

	Cover			Frequency			
Species	Mean Absolute	Relative (%)	Std. Dev. n-1	Absolute	Relative (%)	I.V.	Rank
Perennial Shrubs continued							
Sarcobatus vermiculatus	8.49	22.88	8.79	86.49	15.53	38.41	2
Sub-total	10.65	28.70					
Perennial Succulants							
Opuntia polyacantha	1.35	3.64	1.45	29.73	5.34	8.98	6
Sub-total	1.35	3.64					
Total Vegetation	37.11		10.88				
Lichen	0.48		1.52				
Moss	0.06		0.33				
Litter/Rock	42.54		23.85				
Total Ground Cover	80.19		13.47				
Bare Soil	18.70		13.37				
Total Cover	98.89						
Species Abundance (No. of Species/Sample)	37						

POWERTECH (USA) INC.

POWERTECH (USA) INC
DEWEY-BURDOCK PROJECT
Report: Cover Summary

Site Id: PP
Name: Baseline
Comm. Type/Form: Ponderosa Pine Woodland
Sample Date:7-2-2007 to 7-12-2007

Sample Method: Point Intercept
Sample Size: 50 Meter Transect
Number of Samples: 37
Report Date: 1-14-08

Species	Cover			Frequency			
	Mean Absolute	Relative (%)	Std. Dev. n-1	Absolute	Relative (%)	I.V.	Rank
Cool Season Perennial Grasses							
Carex filifolia	0.11	0.32	0.66	2.70	0.56	0.88	15
Carex geyeri	4.59	13.37	5.49	56.76	11.87	25.24	2
Elymus lanceolatus	0.05	0.15	0.33	2.70	0.56	0.71	16
Elymus smithii	1.24	3.61	1.96	37.84	7.91	11.52	6
Hesperostipa comata	0.16	0.47	0.73	2.70	0.56	1.03	14
Nassella viridula	0.11	0.32	0.46	5.41	1.13	1.45	13
Poa secunda	0.38	1.11	1.69	5.41	1.13	2.24	11
Sub-total	6.64	19.34					
Warm Season Perennial Grasses							
Andropogon scoparius	0.81	2.36	1.52	24.32	5.08	7.44	7
Aristida purpurea var. fendleriana	0.81	2.36	1.73	24.32	5.08	7.44	7
Bouteloua curtipendula	1.68	4.89	2.93	35.14	7.35	12.24	5
Bouteloua gracilis	4.05	11.80	4.58	62.16	12.99	24.79	3
Buchloe dactyloides	0.32	0.93	0.88	13.51	2.82	3.76	9
Sub-total	7.67	22.34					
Annual Grasses							
Bromus japonicus	0.22	0.64	0.63	10.81	2.26	2.90	10
Bromus tectorum	0.05	0.15	0.33	2.70	0.56	0.71	16
Sub-total	0.27	0.79					
Annual Forbs							
Chenopodium berlandieri	0.05	0.15	0.33	2.70	0.56	0.71	16
Draba nemorosa	0.05	0.15	0.33	2.70	0.56	0.71	16
Lappula redowski	0.05	0.15	0.33	2.70	0.56	0.71	16
Sub-total	0.15	0.44					
Biennial Forbs							
Melilotus officinalis	0.05	0.15	0.33	2.70	0.56	0.71	16
Sub-total	0.05	0.15					
Perennial Forbs							
Antennaria parvifolia	0.05	0.15	0.33	2.70	0.56	0.71	16
Erigeron spp.	0.11	0.32	0.66	2.70	0.56	0.88	15
Liatris punctata	0.05	0.15	0.33	2.70	0.56	0.71	16
Thermopsis rhombifolia	0.16	0.47	0.99	2.70	0.56	1.03	14
Vicia americana	0.05	0.15	0.33	2.70	0.56	0.71	16
Sub-total	0.42	1.22					
Perennial Sub-Shrubs							
Artemisia frigada	0.22	0.64	0.63	10.81	2.26	2.90	10
Sub-total	0.22	0.64					
Perennial Shrubs							
Artemisia cana	0.16	0.47	0.99	2.70	0.56	1.03	14
Artemisia tridentata	0.54	1.57	1.12	21.62	4.52	6.09	8
Sub-total	0.70	2.04					

POWERTECH (USA) INC.

POWERTECH (USA) INC
DEWEY-BURDOCK PROJECT
Report: Cover Summary

Site Id: PP
Name: Baseline
Comm. Type/Form: Ponderosa Pine Woodland
Sample Date:7-2-2007 to 7-12-2007

Sample Method: Point Intercept
Sample Size: 50 Meter Transect
Number of Samples: 37
Report Date: 1-14-08

	Cover			Frequency			
Species	Mean Absolute	Relative (%)	Std. Dev. n-1	Absolute	Relative (%)	I.V.	Rank
Perennial Succulants							
Opuntia polyacantha	0.16	0.47	0.55	8.11	1.70	2.16	12
Sub-total	0.16	0.47					
Perennial Trees							
Juniperus scopulorum	2.59	7.54	4.52	32.43	6.78	14.32	4
Pinus ponderosa	15.46	45.03	10.79	91.89	19.21	64.24	1
Sub-total	18.05	52.58					
Total Vegetation	34.33		10.51				
Lichen	0.54		1.30				
Moss	0.38		1.14				
Litter/Rock	53.57		24.32				
Total Ground Cover	88.82		7.68				
Bare Soil	10.54		7.74				
Total Cover	99.36						
Species Abundance (No. of Species/Sample)	29						

POWERTECH (USA) INC.

POWERTECH (USA) INC
DEWEY-BURDOCK PROJECT
Report: Cover Summary

Site Id: UG
Name: Baseline
Comm. Type/Form: Upland Grassland
Sample Date:7-2-2007 to 7-12-2007

Sample Method: Point Intercept
Sample Size: 50 Meter Transect
Number of Samples: 30
Report Date: 1-14-08

Species	Cover Mean Absolute	Cover Relative (%)	Std. Dev. n-1	Frequency Absolute	Frequency Relative (%)	I.V.	Rank
Cool Season Perennial Grasses							
Agropyron cristatum	0.47	1.02	1.63	10.00	2.04	3.06	9
Carex filifolia	3.33	7.24	5.57	50.00	10.20	17.44	5
Elymus smithii	8.53	18.54	7.82	80.00	16.33	34.86	3
Hesperostipa comata	0.33	0.72	1.30	6.67	1.36	2.08	11
Poa secunda	0.07	0.15	0.37	3.33	0.68	0.83	13
Sub-total	12.73	27.66					
Warm Season Perennial Grasses							
Bouteloua gracilis	12.47	27.10	9.82	90.00	18.37	45.46	2
Buchloe dactyloides	12.80	27.81	9.88	90.00	18.37	46.18	1
Sub-total	25.27	54.91					
Annual Grasses							
Bromus japonicus	0.07	0.15	0.37	3.33	0.68	0.83	13
Bromus tectorum	4.07	8.84	5.26	53.33	10.88	19.73	4
Sub-total	4.14	9.00					
Annual Forbs							
Alyssum desertorum	0.67	1.46	1.60	16.67	3.40	4.86	7
Lepidium densiflorum	0.20	0.43	0.81	6.67	1.36	1.80	12
Thlaspi arvense	0.67	1.46	2.31	13.33	2.72	4.18	8
Sub-total	1.54	3.35					
Perennial Forbs							
Sphaeralcea coccinea	0.20	0.43	0.61	10.00	2.04	2.48	10
Sub-total	0.20	0.43					
Perennial Sub-Shrubs							
Artemisia frigada	0.07	0.15	0.37	3.33	0.68	0.83	13
Sub-total	0.07	0.15					
Perennial Succulants							
Opuntia polyacantha	2.07	4.50	2.49	53.33	10.88	15.38	6
Sub-total	2.07	4.50					
Total Vegetation	46.02		13.76				
Lichen	1.80		4.11				
Litter/Rock	41.13		20.69				
Total Ground Cover	88.95		6.07				
Bare Soil	11.07		5.94				
Total Cover	100.02						
Species Abundance (No. of Species/Sample)	15						

POWERTECH (USA) INC.

POWERTECH (USA) INC
DEWEY-BURDOCK PROJECT
Report: Cover Summary

Site Id: CG
Name: Baseline
Comm. Type/Form: Cottonwood Gallery
Sample Date:7-2-2007 to 7-12-2007

Sample Method: Point Intercept
Sample Size: 50 Meter Transect
Number of Samples: 26
Report Date: 1-14-08

Species	Cover Mean Absolute	Cover Relative (%)	Std. Dev. n-1	Frequency Absolute	Frequency Relative (%)	I.V.	Rank
Cool Season Perennial Grasses							
Bromus inermis	18.23	29.12	16.76	92.31	24.49	53.61	1
Elymus smithii	16.46	26.29	15.60	88.46	23.47	49.76	2
Sub-total	34.69	55.41					
Warm Season Perennial Grasses							
Distichlis stricta	0.23	0.37	1.18	3.85	1.02	1.39	10
Sub-total	0.23	0.37					
Annual Grasses							
Bromus japonicus	0.08	0.13	0.39	3.85	1.02	1.15	11
Bromus tectorum	0.69	1.10	1.95	15.38	4.08	5.18	6
Sub-total	0.77	1.23					
Annual Forbs							
Bassia sieveriana	9.77	15.60	15.98	53.85	14.29	29.89	4
Chenopodium album	1.38	2.20	2.76	26.92	7.14	9.35	5
Descurainia sophia	0.08	0.13	0.39	3.85	1.02	1.15	11
Lappula redowski	0.08	0.13	0.39	3.85	1.02	1.15	11
Sub-total	11.31	18.06					
Perennial Forbs							
Achillea millefolium	0.08	0.13	0.39	3.85	1.02	1.15	11
Cirsium arvense	1.38	2.20	6.66	7.69	2.04	4.24	7
Sub-total	1.46	2.33					
Perennial Shrubs							
Artemisia cana	0.15	0.24	0.54	7.69	2.04	2.28	8
Sarcobatus vermiculatus	0.08	0.13	0.39	3.85	1.02	1.15	11
Symphoricarpos occidentalis	0.54	0.86	2.75	3.85	1.02	1.88	9
Sub-total	0.77	1.23					
Perennial Trees							
Populus deltoides	13.38	21.37	20.28	57.69	15.30	36.68	3
Sub-total	13.38	21.37					
Total Vegetation	62.61		15.29				
Lichen	0.00		0.00				
Litter/Rock	35.00		12.83				
Total Ground Cover	97.62		4.16				
Bare Soil	2.38		4.16				
Total Cover	100.00						
Species Abundance (No. of Species/Sample)	15						

APPENDIX 3.5-D

VEGETATION DENSITY SUMMARIES

POWERTECH (USA) INC.

POWERTECH (USA) INC
DEWEY-BURDOCK PROJECT
Report: Density Summary

Site Id: BS
Name: Baseline
Comm. Type/Form: Big Sagebrush
Sample Date:7-2-2007 to 7-12-2007

Sample Method: Transect
Sample Size: 50 Meter Transect
Number of Samples: 27
Report Date: 1-14-08

	Mean (Number/Plot)	Relative Density	Std. Dev. n-1 (Number/Plot)	Mean (Number/sq.m.)	Mean (Number/Acre)
Full Shrubs					
Artemisia tridentata	24.26	53.65	14.83	0.49	1,964.33
Sub-Total	24.26	53.65		0.49	1,964.33
Sub-Shrubs & Half-Shrubs					
Artemisia frigada	20.52	45.38	40.21	0.41	1,661.50
Gutierrezia sarothrae	0.44	0.97	1.15	0.01	35.63
Sub-Total	20.96	46.35		0.42	1,697.13
Total	45.22	100.00		0.90	3,661.46

POWERTECH (USA) INC.

POWERTECH (USA) INC
DEWEY-BURDOCK PROJECT
Report: Density Summary

Site Id: GW
Name: Baseline
Comm. Type/Form: Greasewood Shrubland
Sample Date:7-2-2007 to 7-12-2007

Sample Method: Transect
Sample Size: 50 Meter Transect
Number of Samples: 37
Report Date: 1-14-08

	Mean (Number/Plot)	Relative Density	Std. Dev. n-1 (Number/Plot)	Mean (Number/sq.m.)	Mean (Number/Acre)
Full Shrubs					
Artemisia cana	3.81	11.91	9.89	0.08	308.50
Artemisia tridentata	5.59	17.48	12.13	0.11	452.62
Ericameria nauseosa	0.22	0.69	1.32	0.00	17.81
Sarcobatus vermiculatus	22.22	69.48	20.88	0.44	1,799.15
Sub-Total	31.84	99.56		0.64	2,578.08
Sub-Shrubs & Half-Shrubs					
Artemisia frigida	0.14	0.44	0.48	0.003	11.34
Sub-Total	0.14	0.44		0.003	11.34
Total	31.98	100.00		0.64	2,589.42

POWERTECH (USA) INC.

POWERTECH (USA) INC
DEWEY-BURDOCK PROJECT
Report: Density Summary

Site Id: PP
Name: Baseline
Comm. Type/Form: Ponderosa Pine Woodland
Sample Date:7-2-2007 to 7-12-2007

Sample Method: Transect
Sample Size: 50 Meter Transect
Number of Samples: 37
Report Date: 1-14-2008

	Mean (Number/Plot)	Relative Density	Std. Dev. n-1 (Number/Plot)	Mean (Number/sq.m.)	Mean (Number/Acre)
Full Shrubs					
Artemisia cana	2.11	13.96	12.82	0.04	170.85
Artemisia tridentata	4.14	27.38	7.05	0.08	335.22
Chrysothamnus viscidflorus	0.22	1.46	0.67	0.004	17.81
Ericameria nauseosa	0.14	0.93	0.54	0.003	11.34
Sub-Total	6.61	43.72		0.13	535.21
Sub-Shrubs & Half-Shrubs					
Artemisia frigada	6.92	45.77	16.08	0.14	560.31
Gutierrezia sarothrae	1.51	9.99	5.86	0.03	122.26
Rosa arkansana	0.03	0.20	0.33	0.001	2.43
Yucca glauca	0.05	0.33	0.16	0.001	4.05
Sub-Total	8.51	56.28		0.17	689.05
Total	15.12	100.00		0.30	1,224.27

POWERTECH (USA) INC.

POWERTECH (USA) INC
DEWEY-BURDOCK PROJECT
Report: Density Summary

Site Id: UG
Name: Baseline
Comm. Type/Form: Upland Grassland
Sample Date:7-2-2007 to 7-12-2007

Sample Method: Transect
Sample Size: 50 Meter Transect
Number of Samples: 30
Report Date: 1-14-08

	Mean (Number/Plot)	Relative Density	Std. Dev. n-1 (Number/Plot)	Mean (Number/sq.m.)	Mean (Number/Acre)
Full Shrubs					
Artemisia tridentata	0.13	20.63	0.43	0.003	10.53
Sub-Total	0.13	20.63		0.003	10.53
Sub-Shrubs & Half-Shrubs					
Artemisia frigada	0.47	74.60	2.56	0.01	38.06
Gutierrezia sarothrae	0.03	4.76	0.18	0.00	2.43
Sub-Total	0.50	79.37		0.01	40.49
Total	0.63	100.00		0.01	51.01

POWERTECH (USA) INC.

POWERTECH (USA) INC
DEWEY-BURDOCK PROJECT
Report: Density Summary

Site Id: CG
Name: Baseline
Comm. Type/Form: Cottonwood Gallery
Sample Date:7-2-2007 to 7-12-2007

Sample Method: Transect
Sample Size: 50 Meter Transect
Number of Samples: 26
Report Date: 1-14-08

	Mean (Number/Plot)	Relative Density	Std. Dev. n-1 (Number/Plot)	Mean (Number/sq.m.)	Mean (Number/Acre)
Full Shrubs					
Artemisa cana	0.5	7.13	1.12	0.01	40.49
Artemisia tridentata	0.04	0.57	0.19	0.00	3.24
Ericameria nauseosa	0.04	0.57	0.19	0.00	3.24
Sarcobatus vermiculatus	0.08	1.14	0.27	0.00	6.48
Symphoricarpos occidentalis	6.35	90.58	31.73	0.13	514.16
Sub-Total	7.01	100.00		0.14	567.60
Total	7.01	100.00		0.14	567.60

APPENDIX 3.5-E

PONDEROSA PINE WOODLAND TREE DENISTY SUMMARY

POWERTECH (USA) INC.

POWERTECH (USA) INC
DEWEY-BURDOCK PROJECT
Report: Density Summary

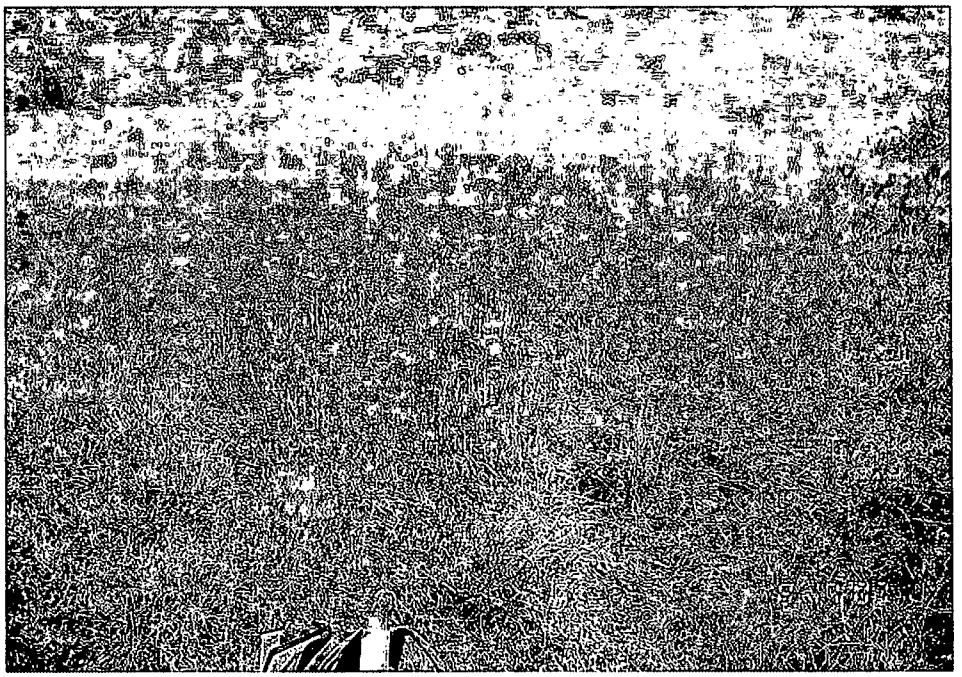
Site Id: PP
Name: Baseline
Comm. Type/Form: Ponderosa Pine Woodland
Sample Date:7-2-2007 to 7-12-2007

Sample Method: Transect
Sample Size: 50 Meter Transect
Number of Samples: 37
Report Date: 1-14-2008

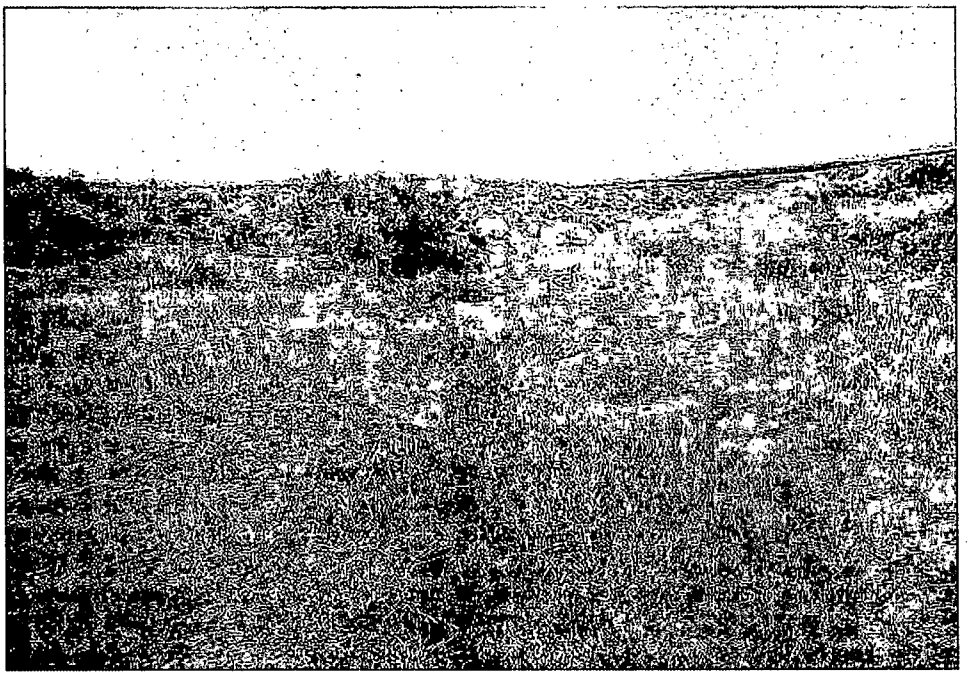
	Std. Dev. n-1 (Number/Plot)	Mean (Number/sq.m.)	Mean (Number/Acre)
Trees			
Pinus ponderosa	15.10	0.019	75.88
Sub-Total		0.019	75.88
Total		0.019	75.88

APPENDIX 3.5-F

WETLAND PHOTOGRAPHS



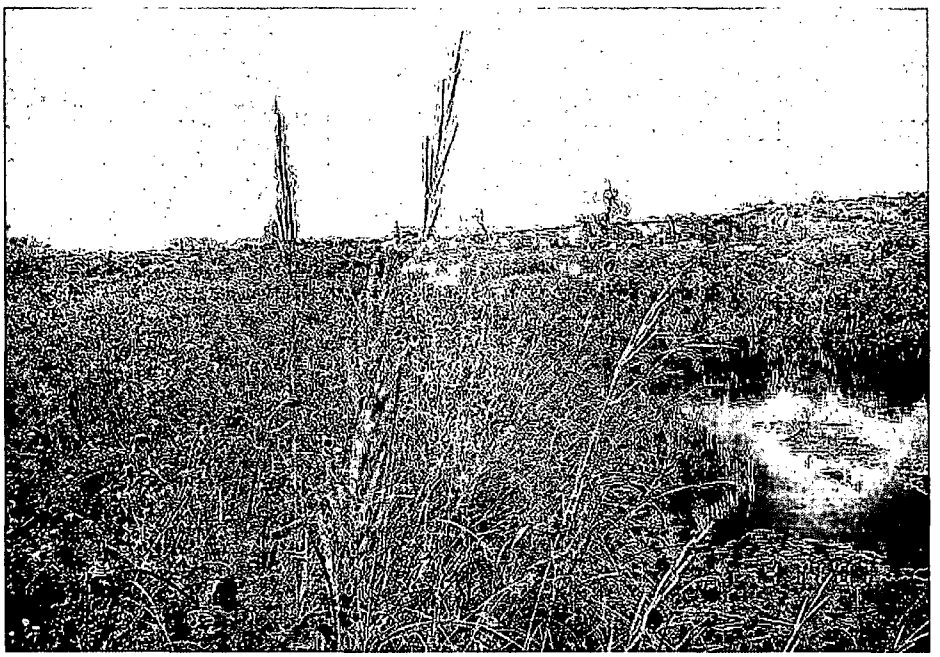
W1, R1 P1: Depression, non-wetland



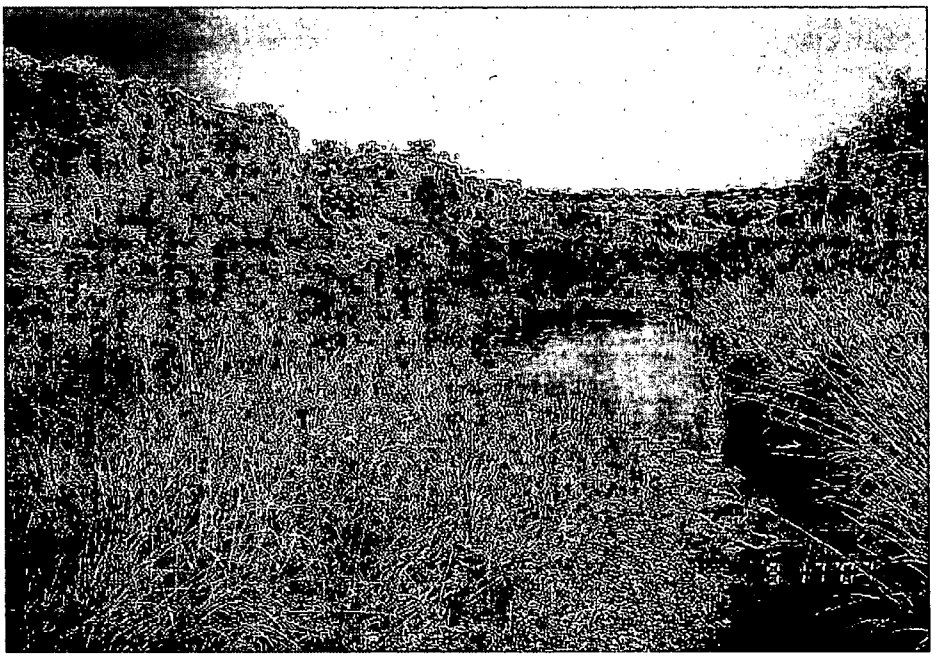
W3, R1 P12: Upstream, non-wetland



W3, R1 P13: Downstream, non-wetland



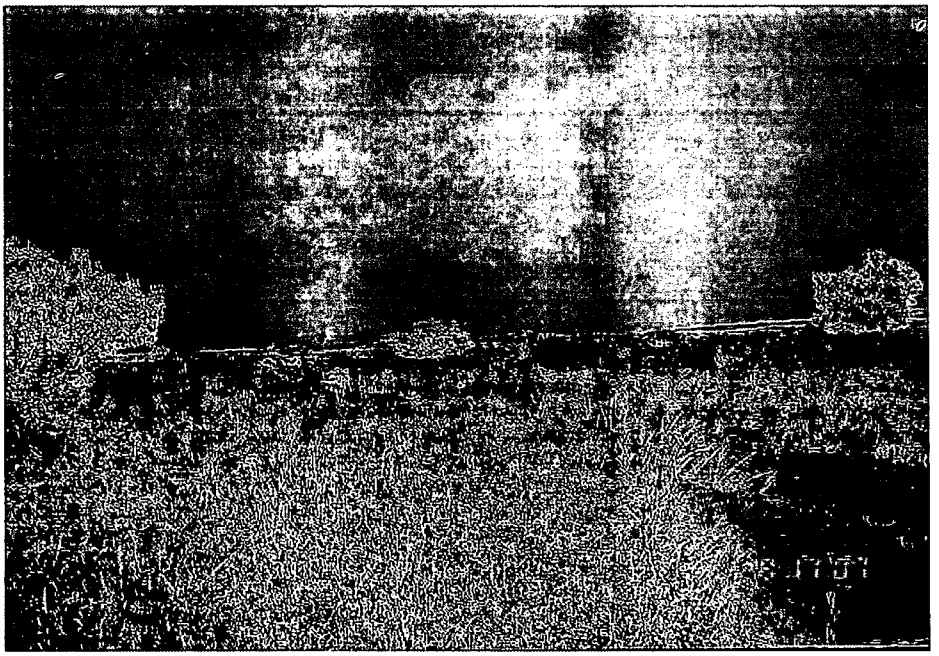
W4, R1 P2: Upstream, wetland



W4, R1 P3: Downstream, wetland



W4, R1 P4: Tributary



Wpt. 3, R1 P6: Upstream, wetland



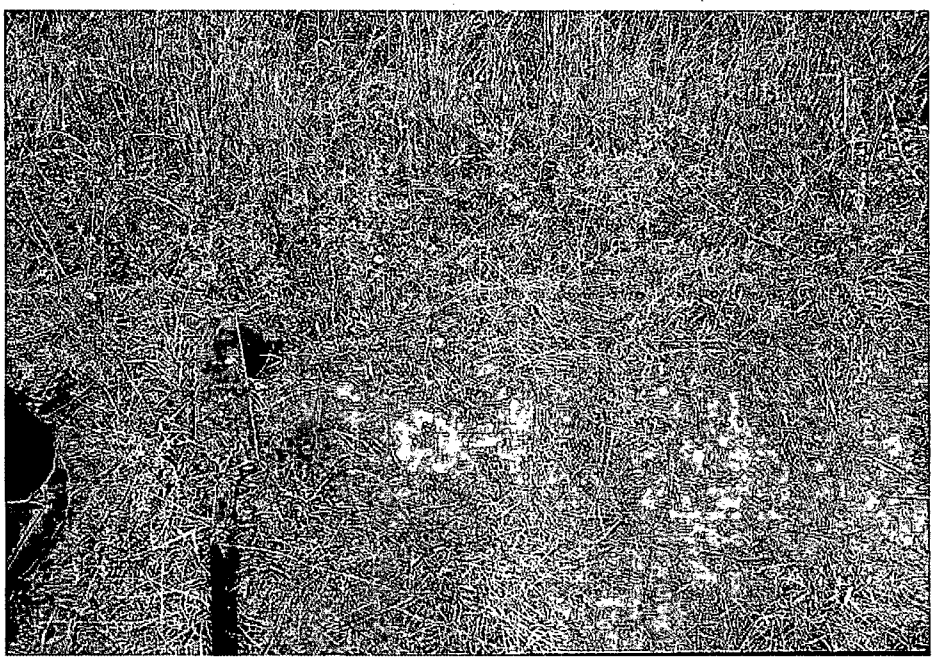
Wpt. 3, R1 P7: Downstream, wetland



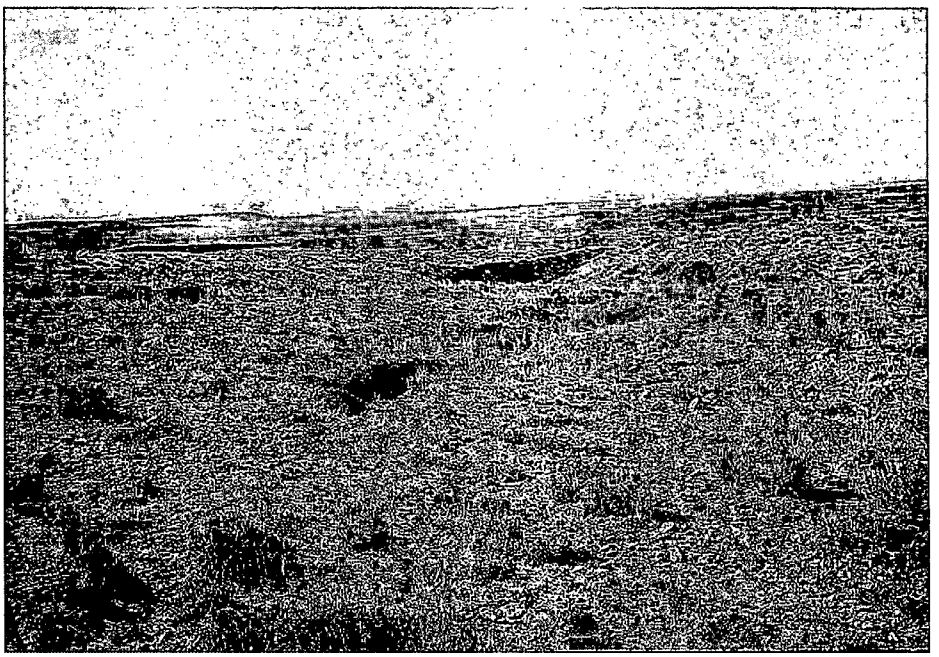
Wpt. 4, R1 P8: Upstream, wetland



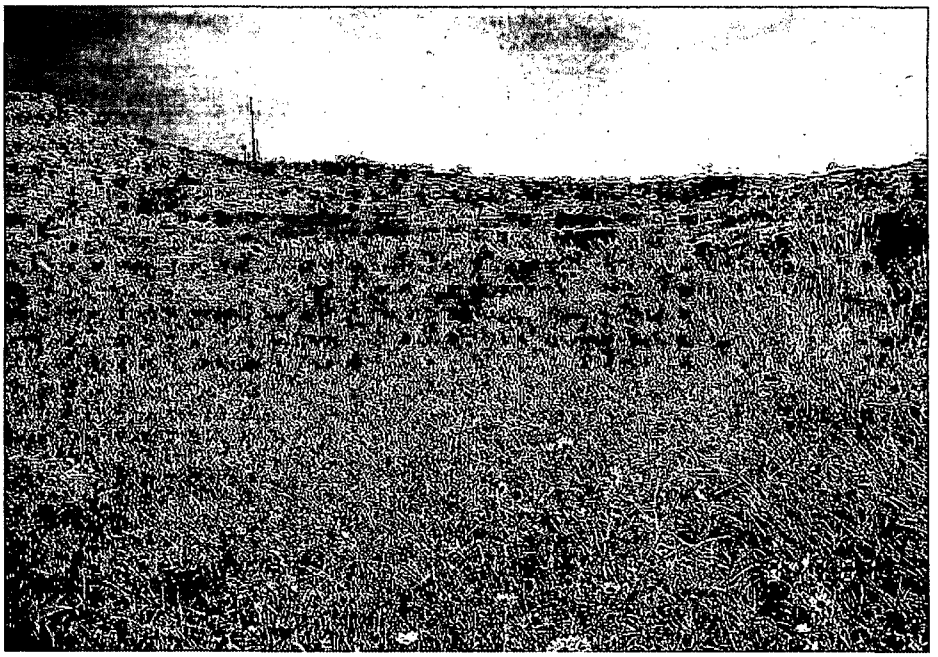
Wpt. 4, R1 P9: Downstream, wetland



W5, R1 P5: Upland, non-wetland



W6, R1 P16: View of the drainage



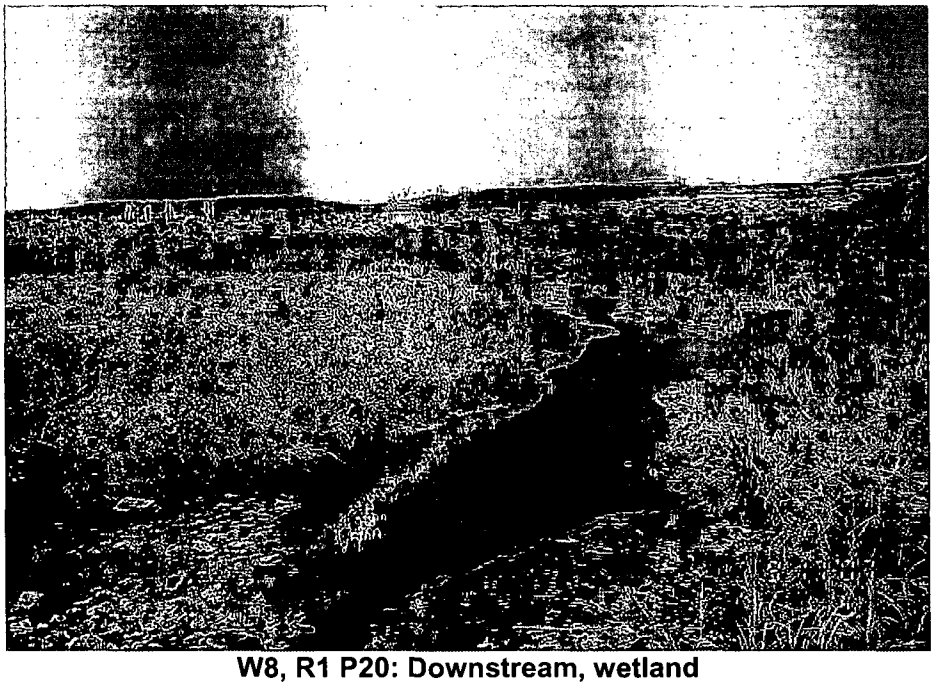
W7, R1 P17: Upstream, wetland



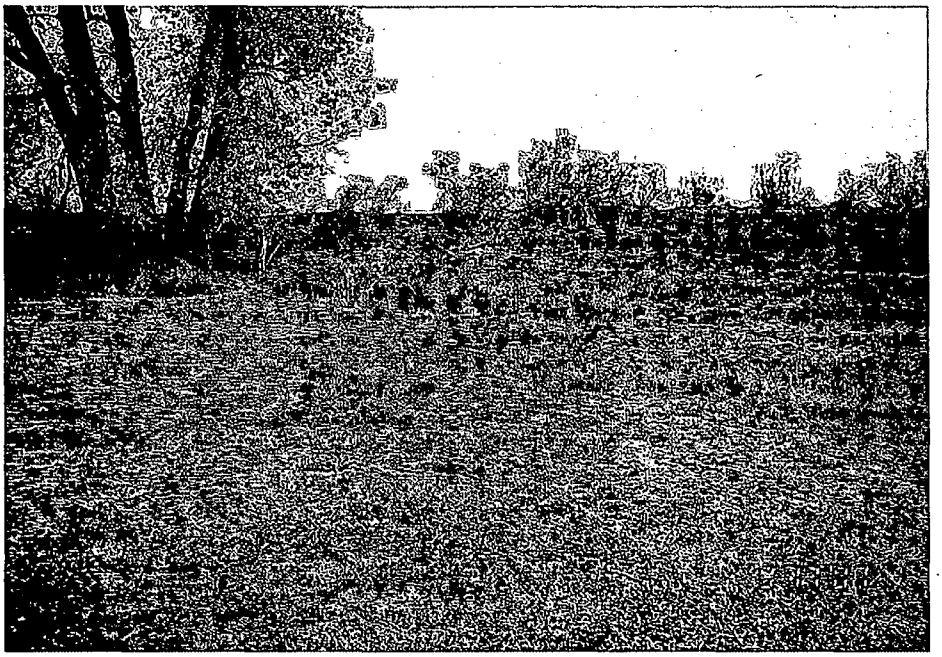
W7, R1 P18: Downstream



W8, R1 P19: Upstream, wetland



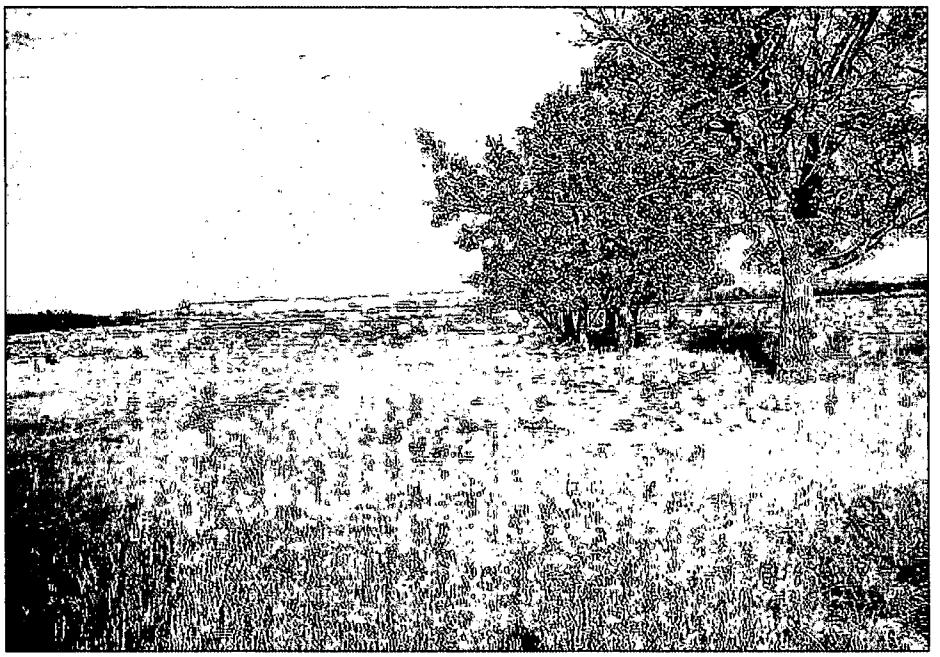
W8, R1 P20: Downstream, wetland



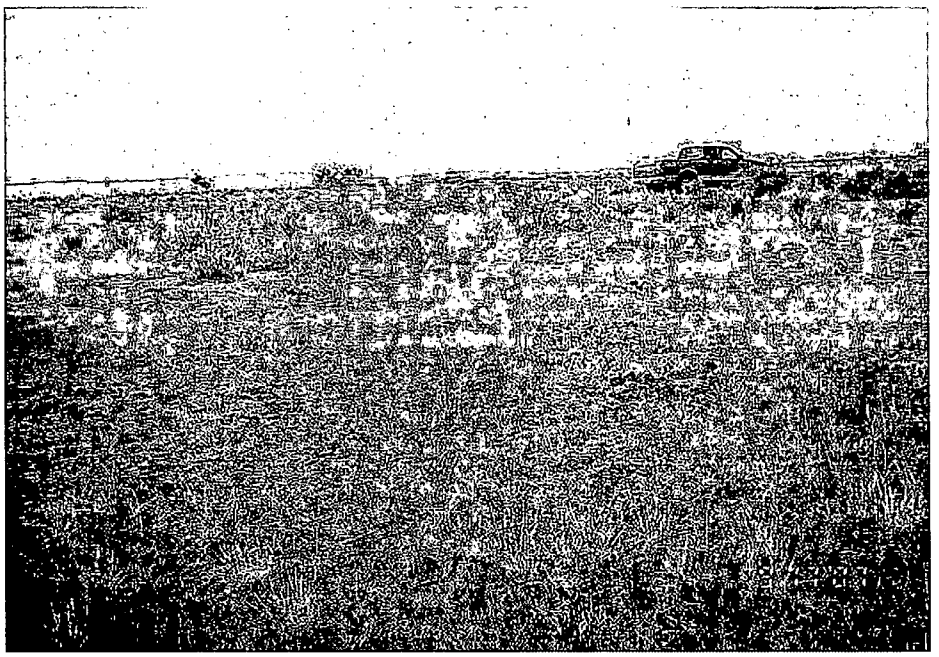
W9, R1 P23: Upstream depression, wetland



W9, R1 P24: Downstream depression, wetland



W10, R2 P1: Downstream, wetland



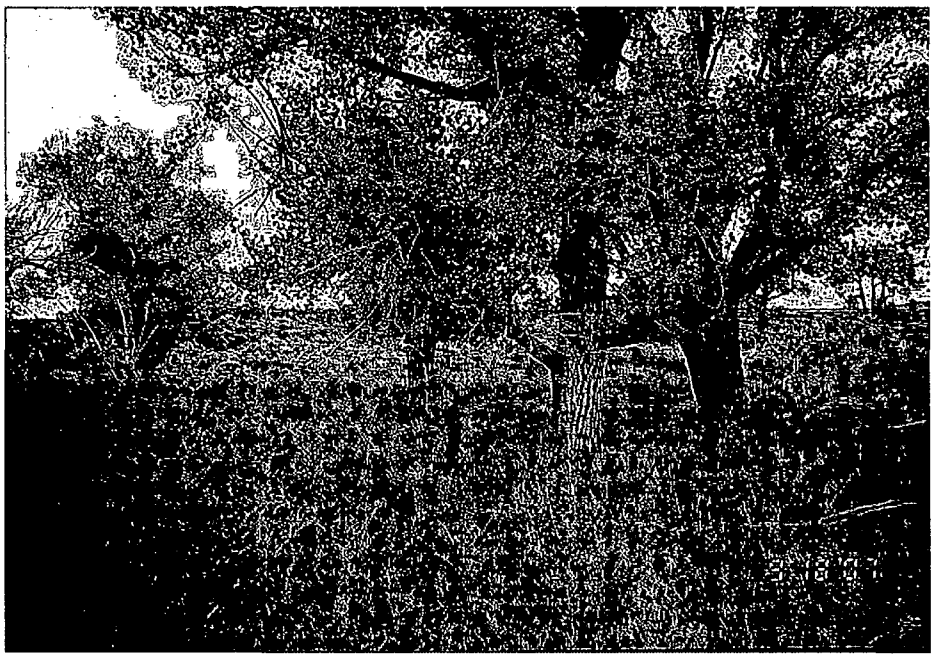
W10, R2 P2: Upstream, wetland



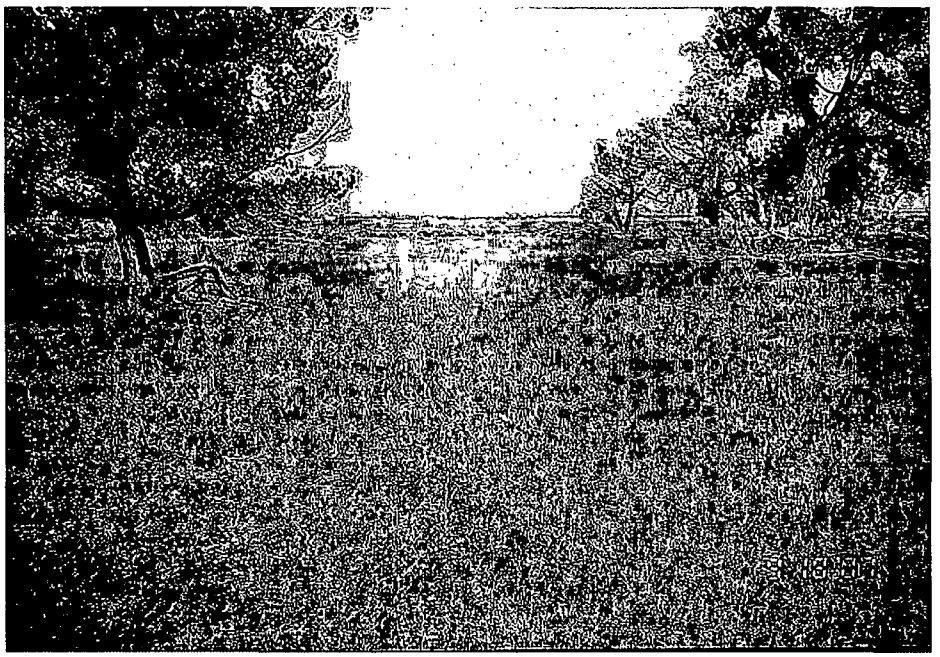
W11, R2 P3: West



W11, R2 P4: East



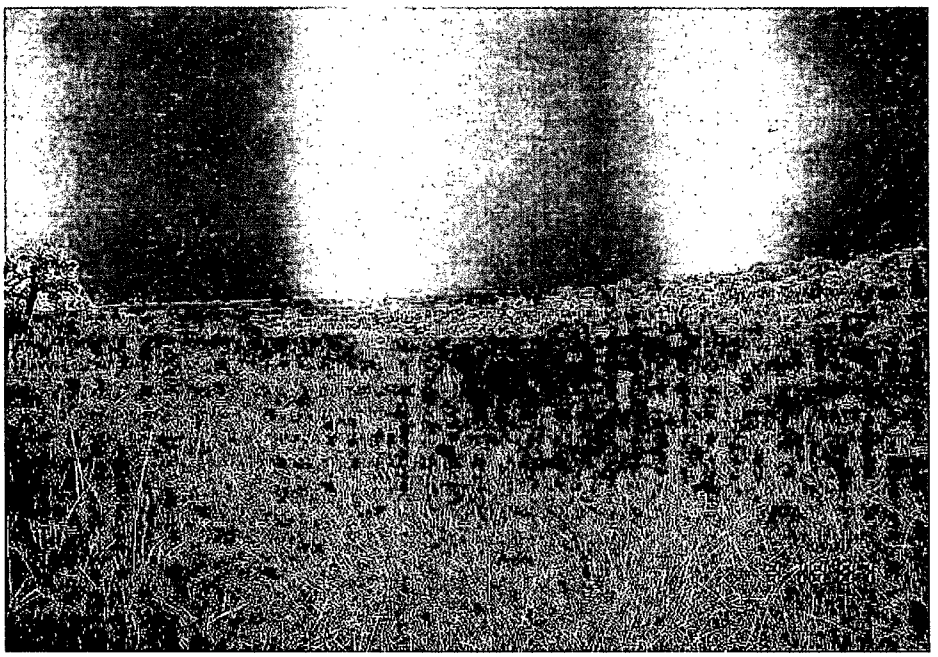
W12, R2 P5: West, non-wetland



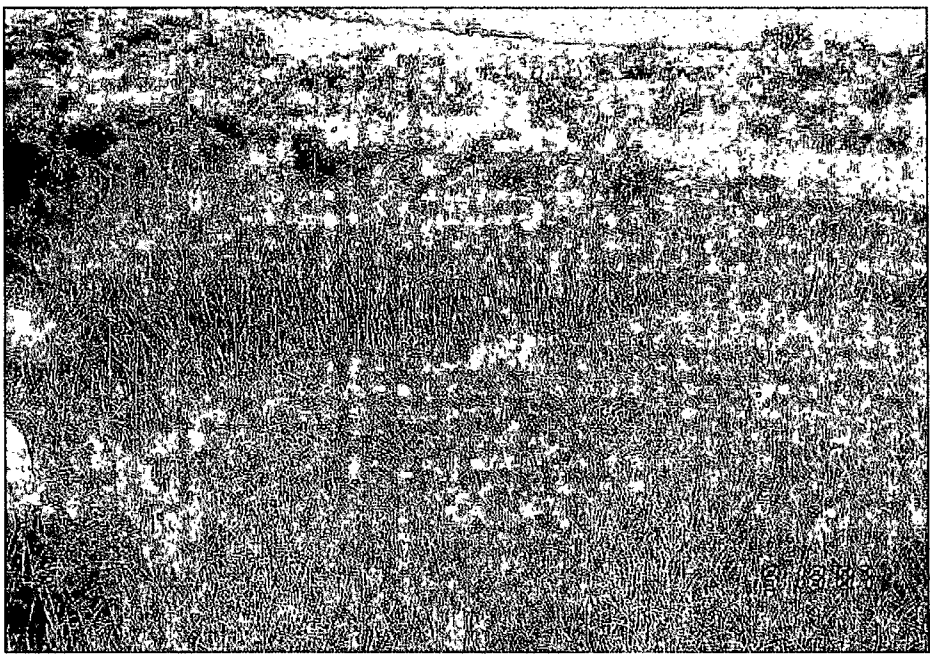
W12, R2 P6: East, non-wetland



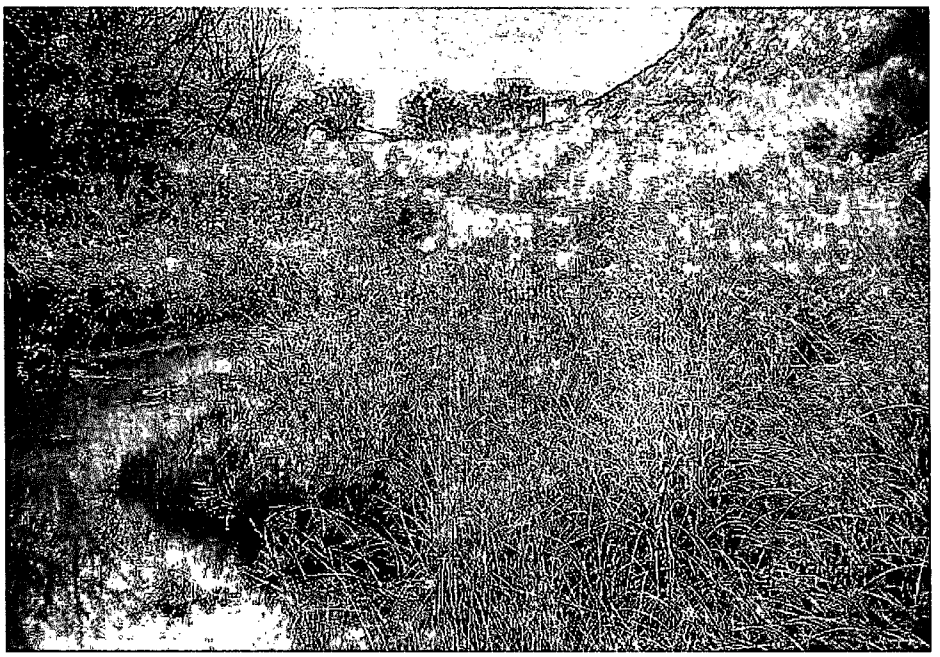
W14, R2 P7: Upstream, wetland



W14, R2 P8: Downstream, wetland



W14, R2 P9: General area of PEMC



W15, R2 P12: Upstream, wetland



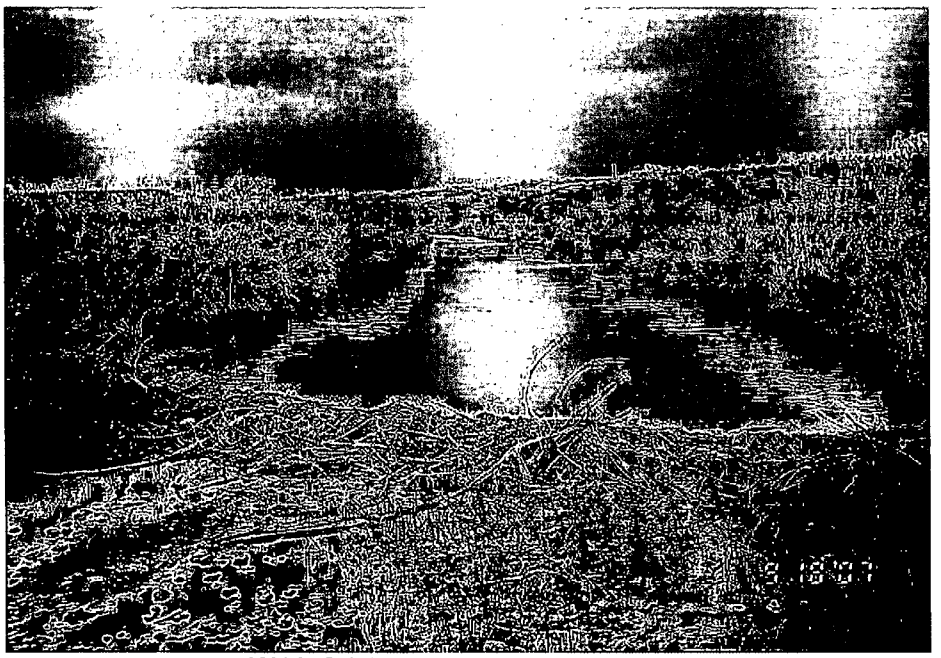
W15, R2 P13: Downstream, wetland



Wpt. 22, R2, P14: Upstream wetland



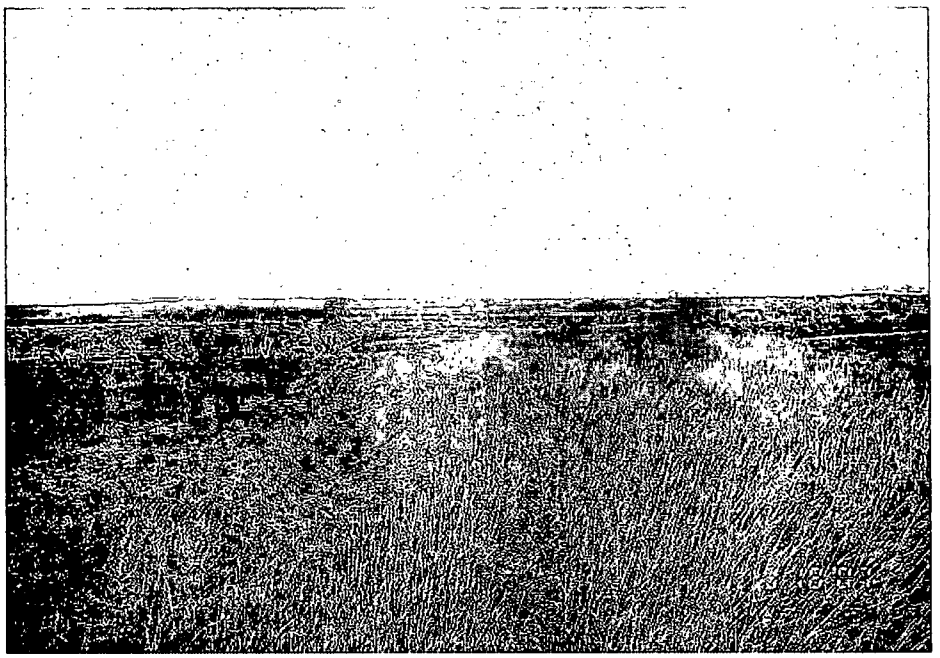
Wpt. 22, R2, P15: Downstream, wetland



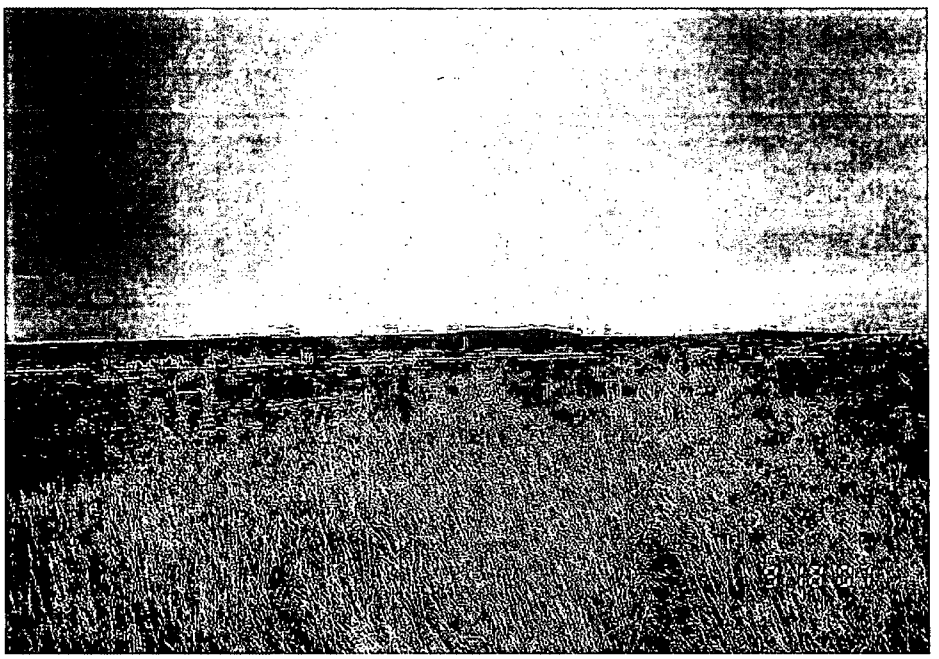
W16, R2 P18: Upstream, wetland



W16, R2 P19: Downstream, wetland



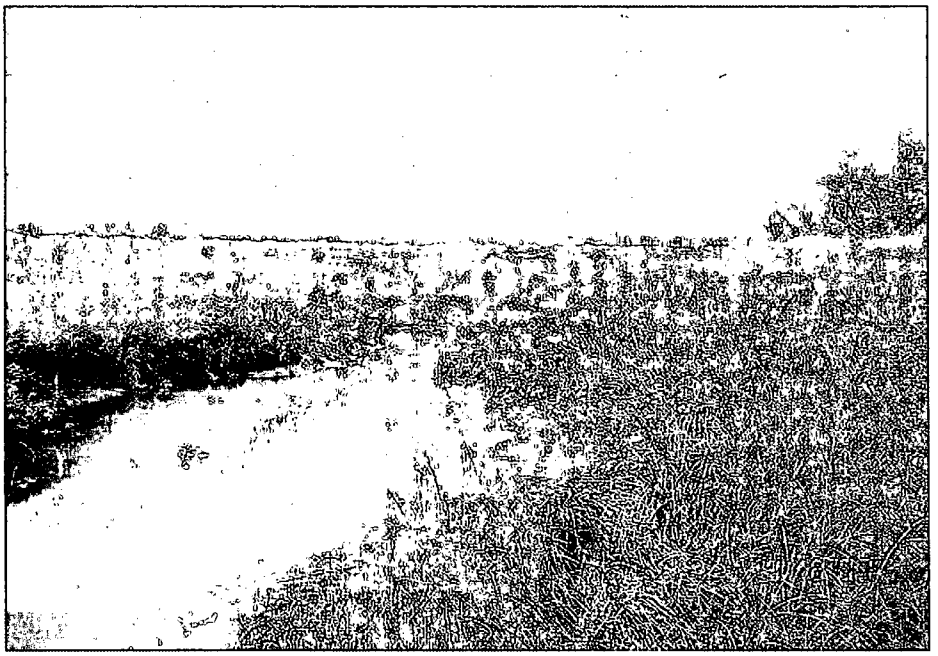
W17, R2 P22: Upstream, non-wetland



W17, R2 P23: Downstream, non-wetland



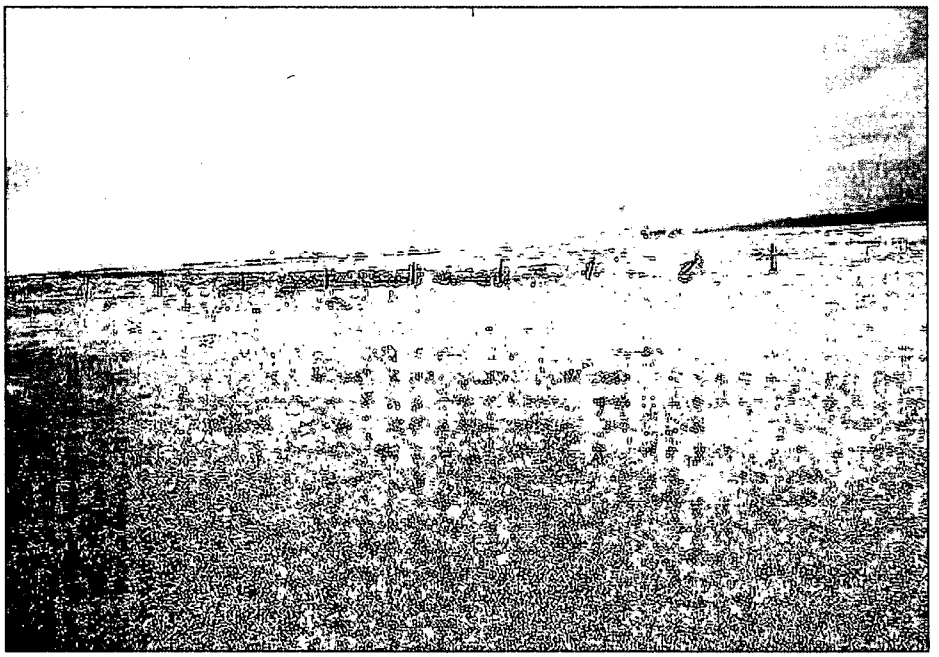
Wpt. 26, R2 P24: Similar to W18, wetland



W18, R3 P1: Upstream, wetland



W18, R3 P2: Downstream, wetland



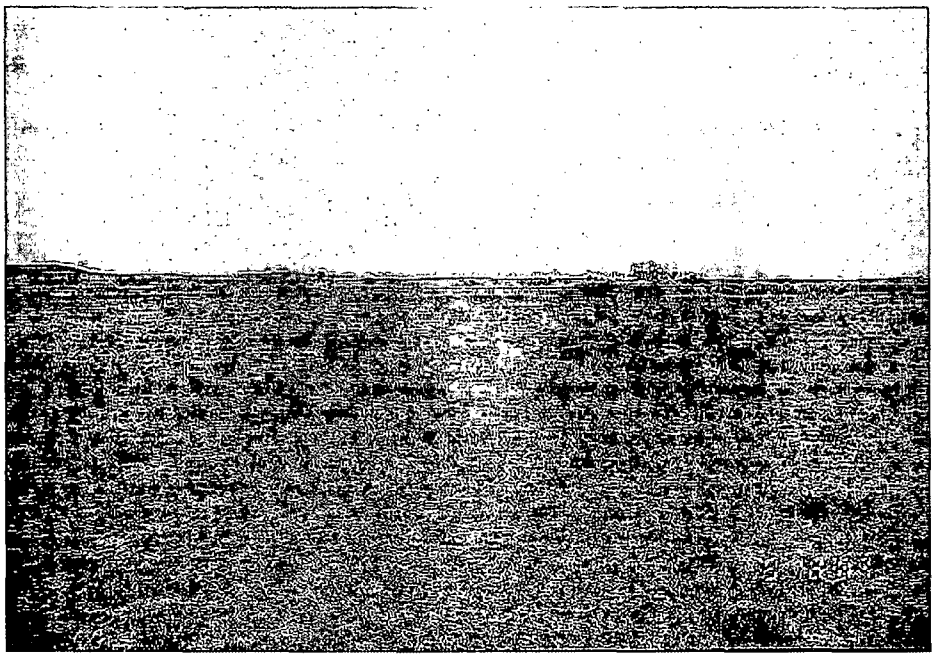
W19, R3 P3: Northwest, non-wetland



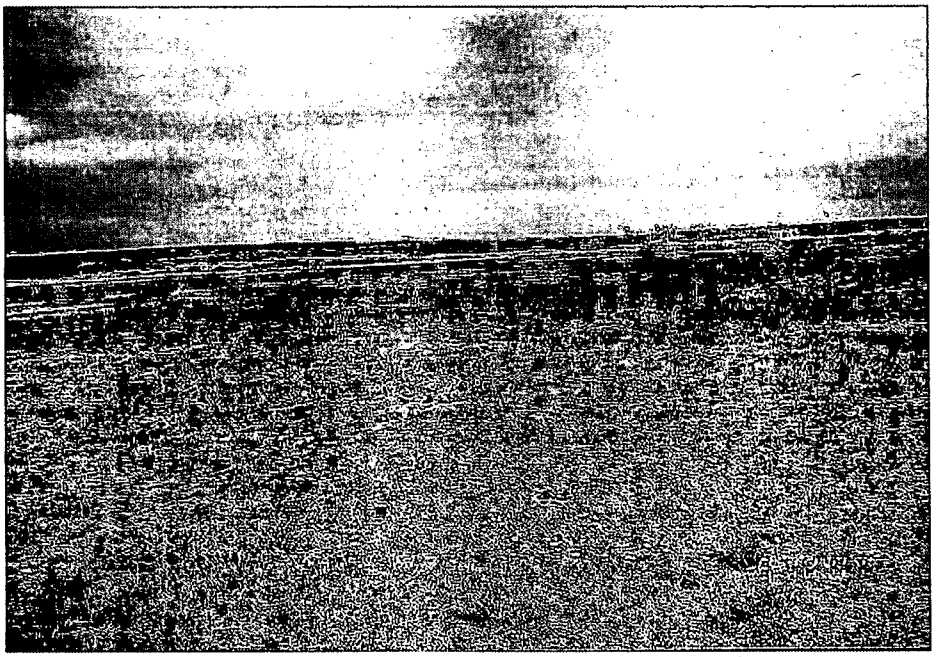
W19, R3 P4: East, non-wetland



Wpt. 27, R3 P5: Drainage, non-wetland



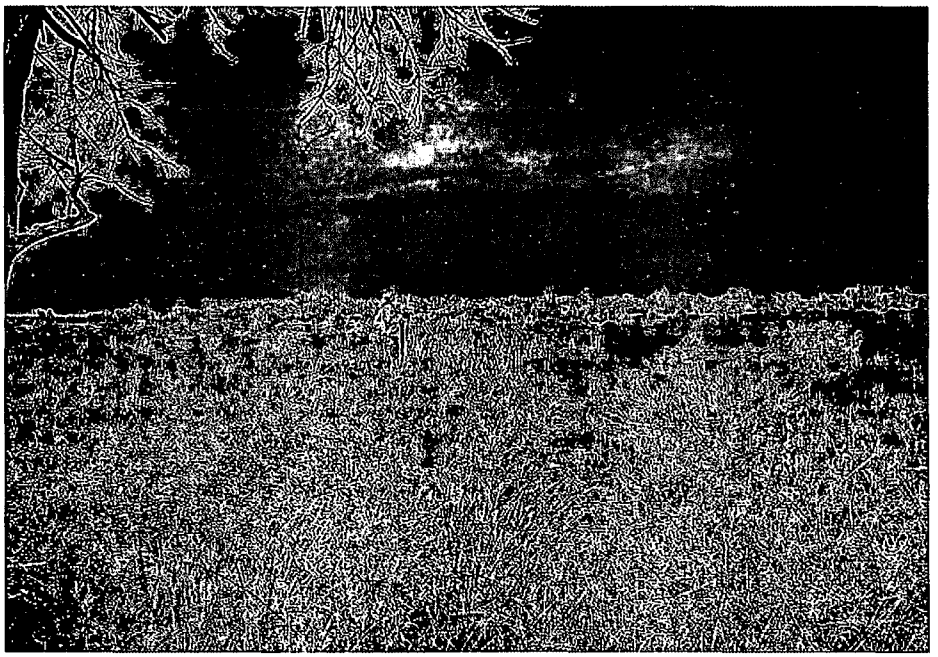
Wpt. 29, R3 P6: Depression, non-wetland



Wpt. 29, R3 P7: Depression, non-wetland



W20, R3 P8: Upstream, wetland



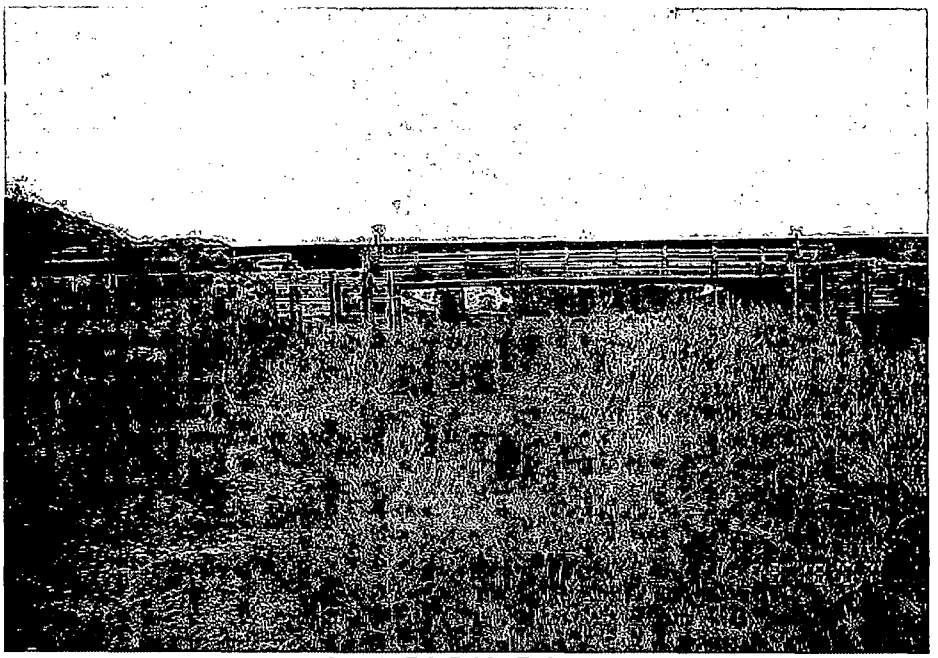
W20, R3 P9: Downstream, wetland



W21, R3 P10: Upstream, wetland



W21, R3 P11: Downstream, wetland



W21, R3 P12: Bridge



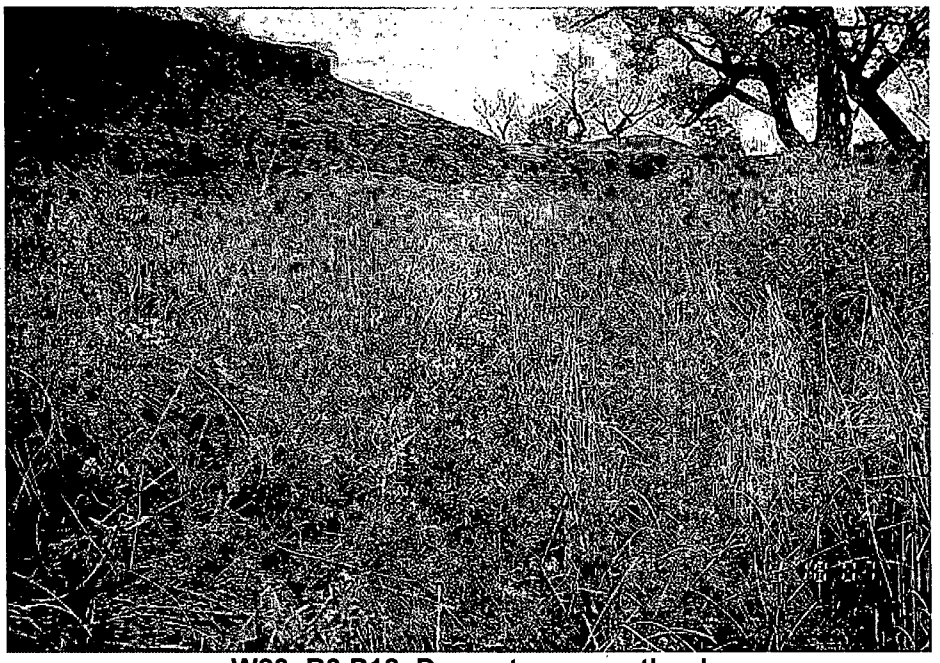
W22, R3 P13: Upstream, wetland



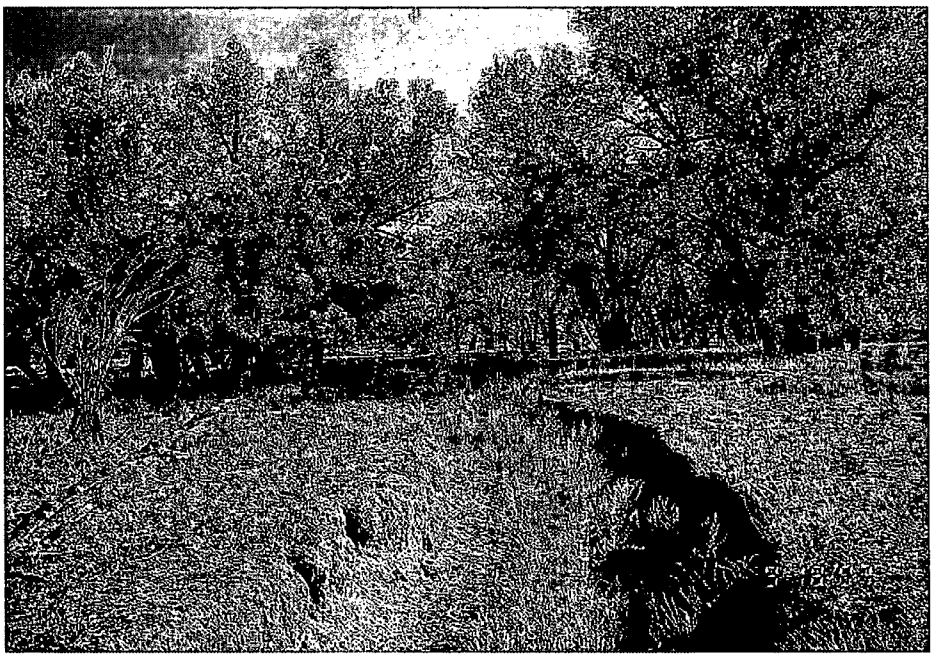
W22, R3 P14: Downstream, wetland



W23, R3 P17: Upstream, wetland



W23, R3 P18, Downstream, wetland



Wpt. 35, R4 P23: Upstream, non-wetland



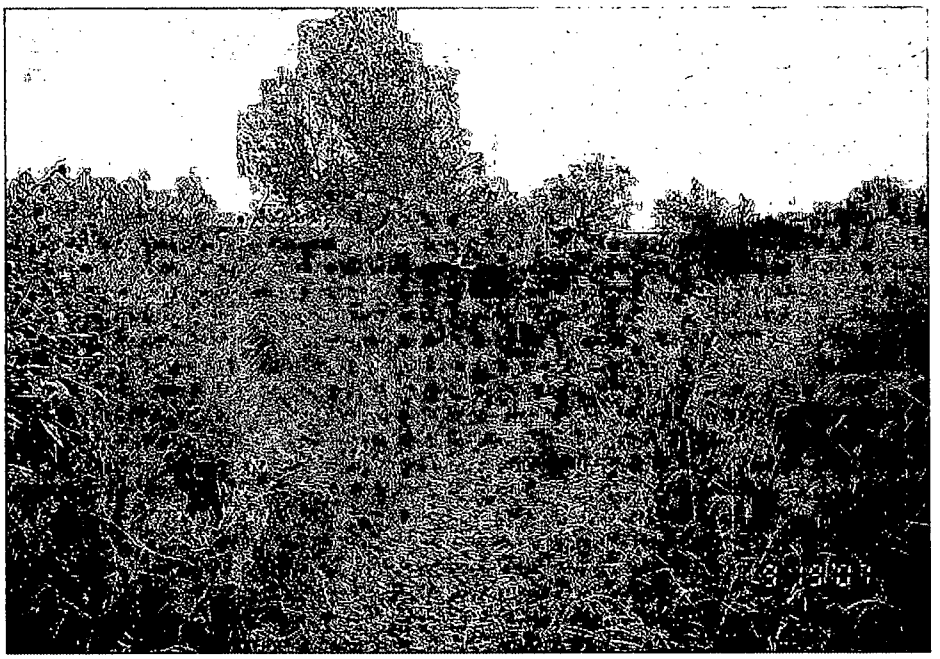
Wpt. 35, R4 P24: downstream, non-wetland



W25, R4 P1: Upstream, non-wetland



W25, R4 P2: Downstream, non-wetland



W26, R4 P3: Upstream, non-wetland



W26, R4 P4: Downstream, non-wetland



W27, R4 P11: Upstream, non-wetland



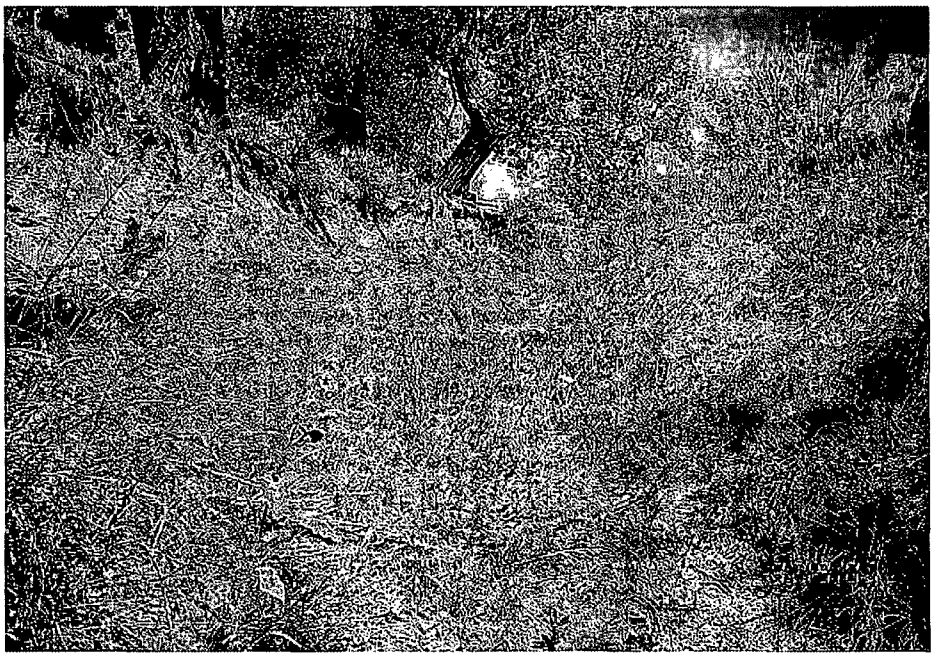
W27, R4 P12: Downstream, non-wetland



W28, R4 P13: Upstream, non-wetland



W28, R4 P14: Downstream, non-wetland



W29, R4 P17: Upstream, non-wetland



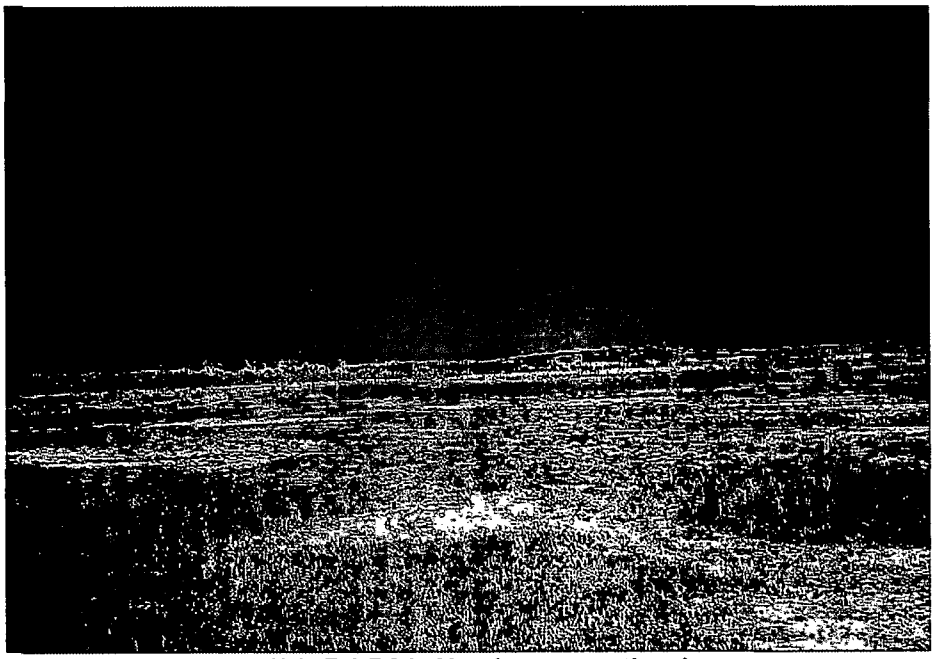
W29, R4 P18: Downstream, non-wetland



W30, R4 P19: East, non-wetland



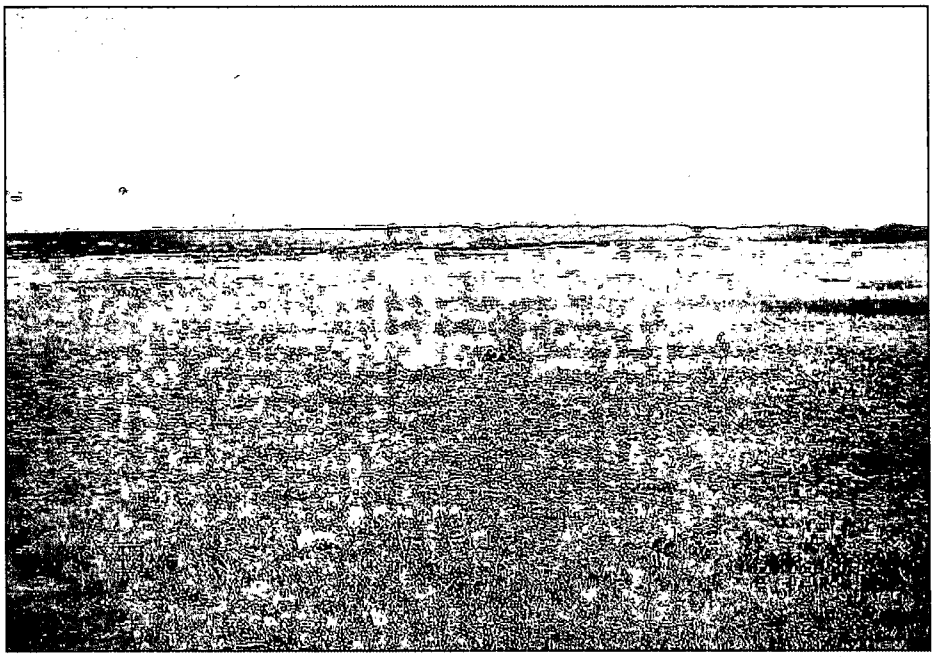
W30, R4 P20: West, non-wetland



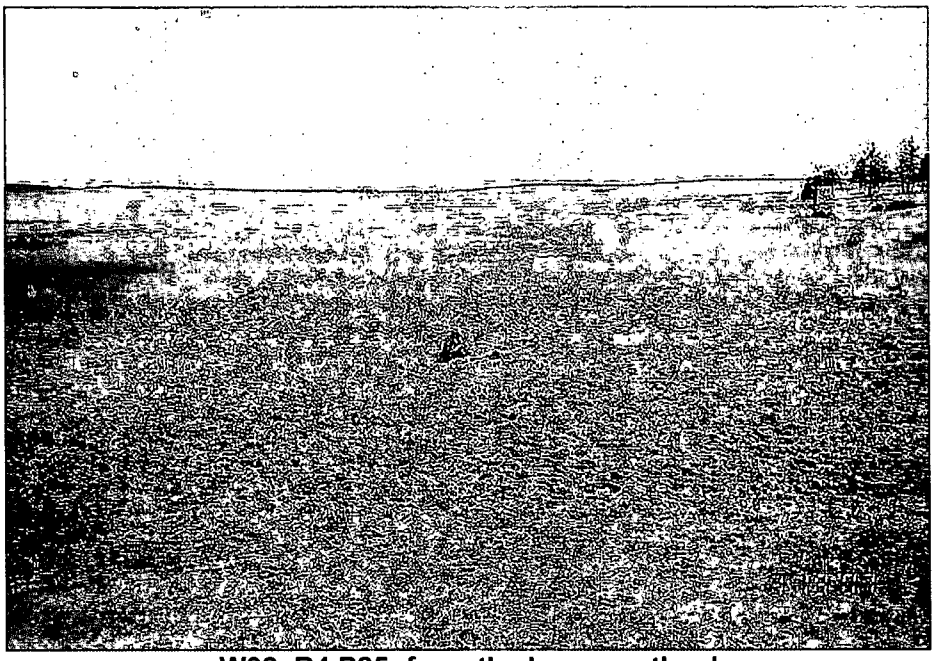
W31, R4 P21: Northeast, wetland



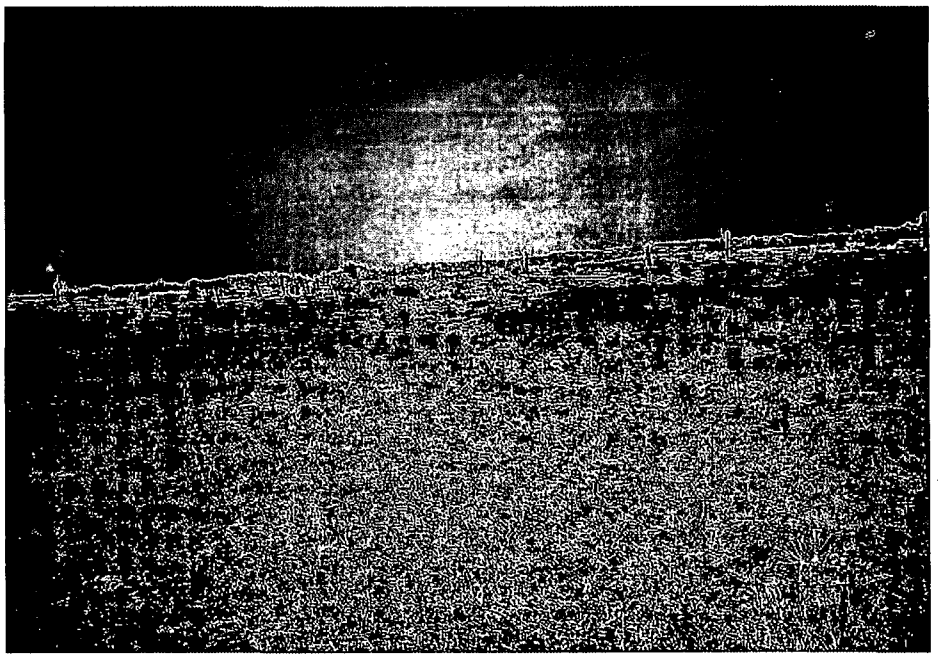
W31, R4 P22: East-southeast, wetland



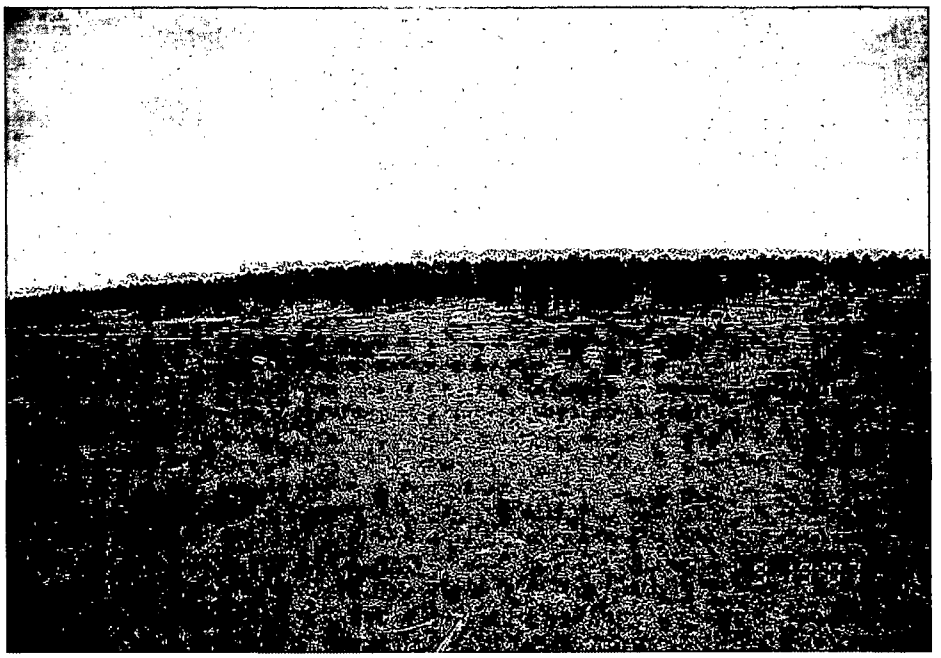
W32, R4 P24: Previously mapped PEM wetland, wetland



W32, R4 P25: from the berm, wetland



W33, R5 P1: Upstream, wetland



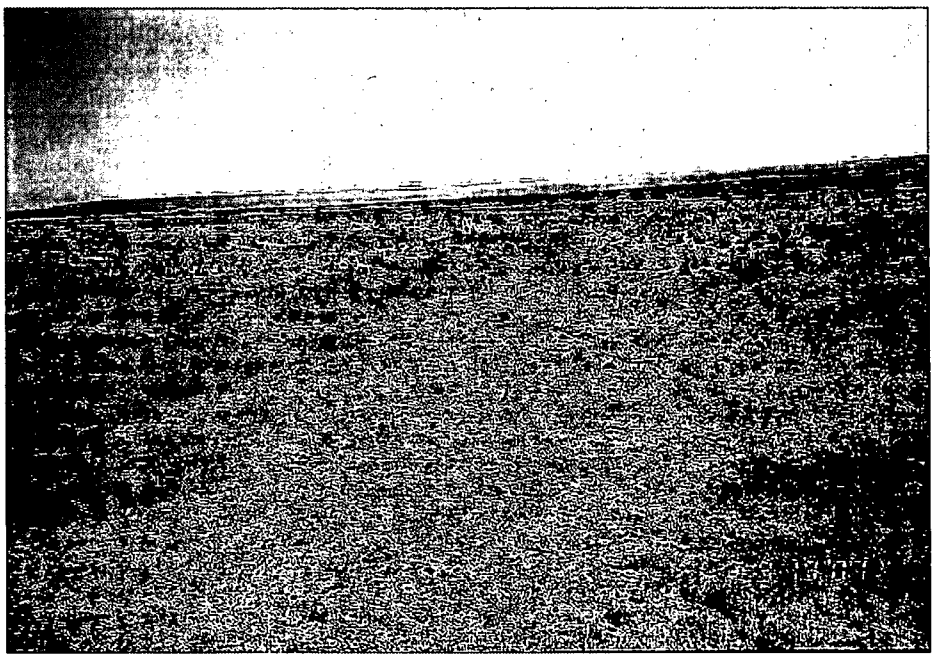
W33, R5 P2: Downstream, wetland



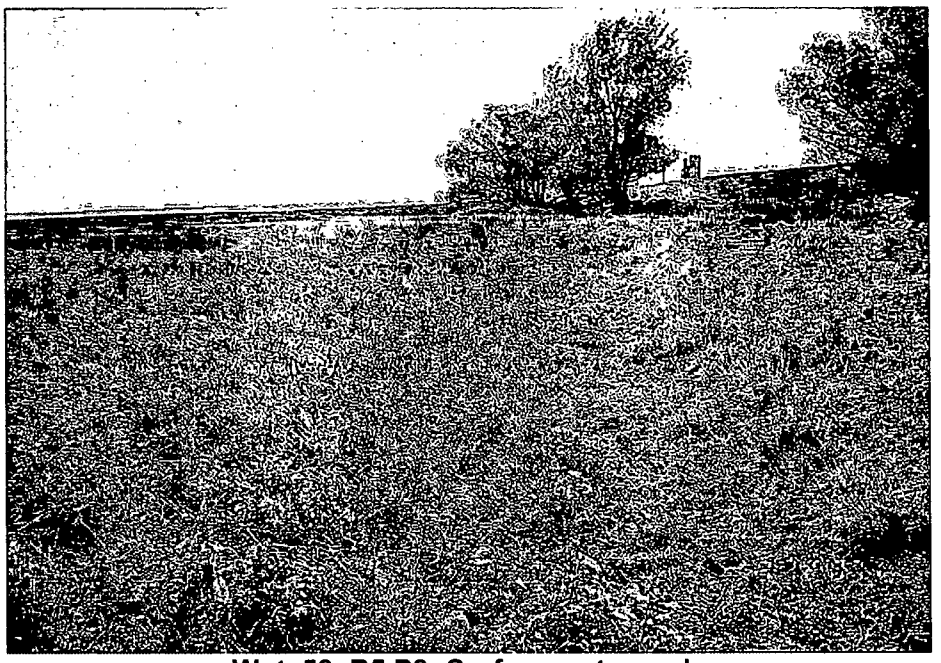
Wpt. 56, R5 P3: Depression, non-wetland



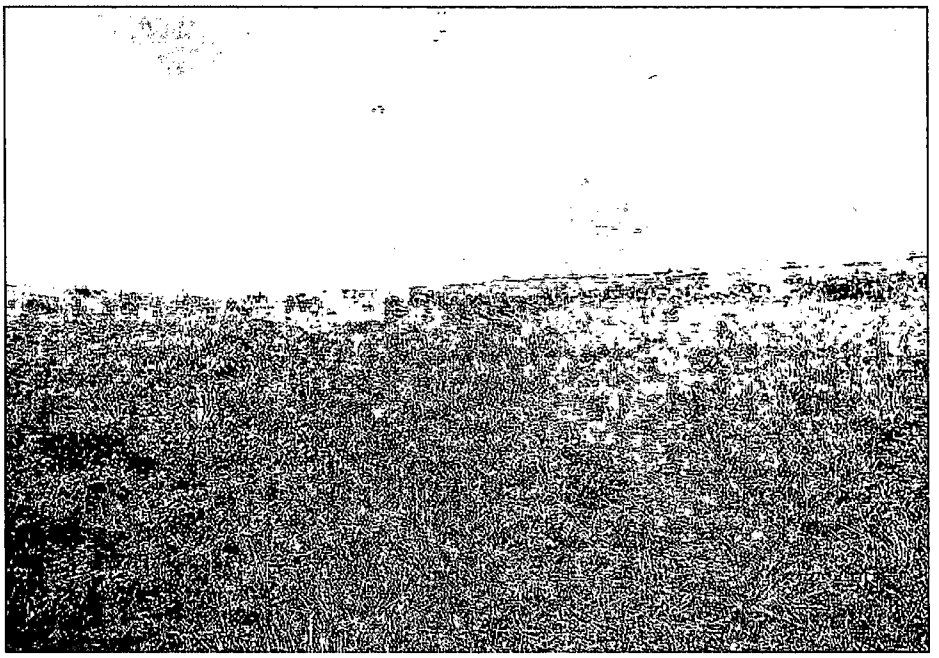
Wpt. 56, R5 P4: Depression, non-wetland



Wpt. 57, R5 P5: Depression, non-wetland



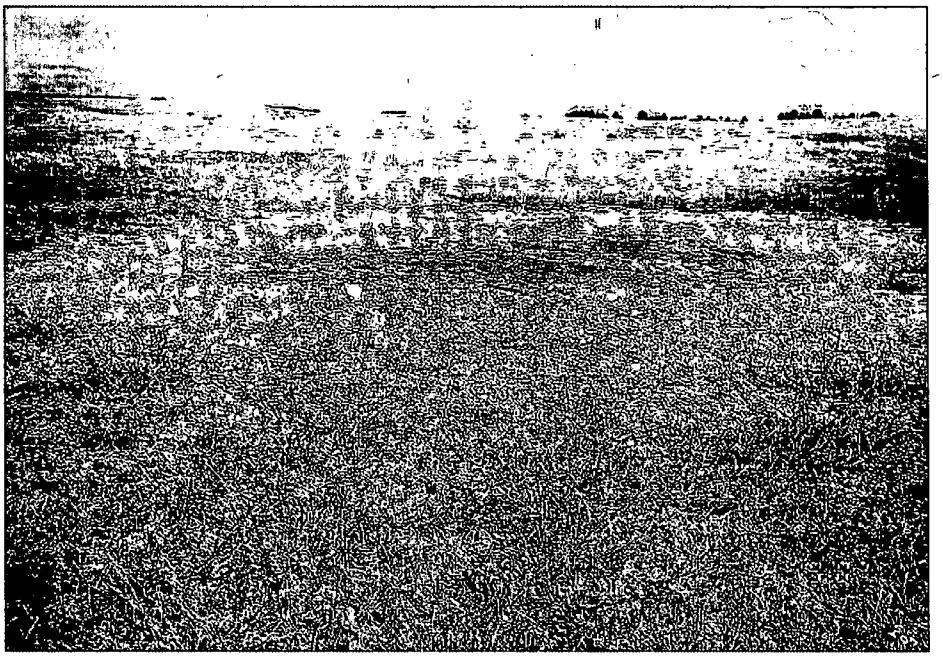
Wpt. 58, R5 P8: Surface water ends



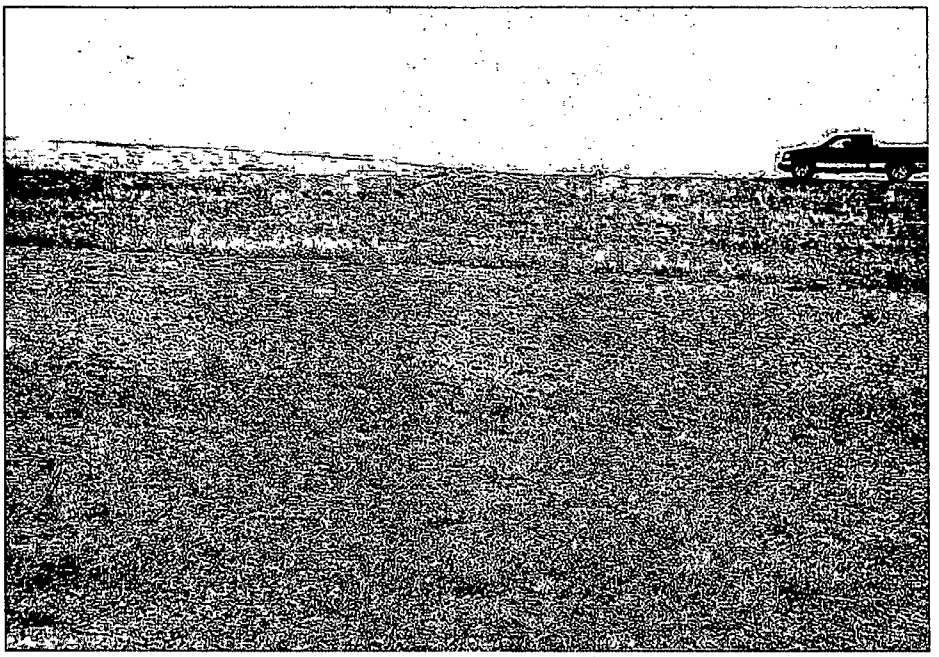
W34, R5 P9: Upstream, non-wetland



W34, R5 P10: Downstream, non-wetland



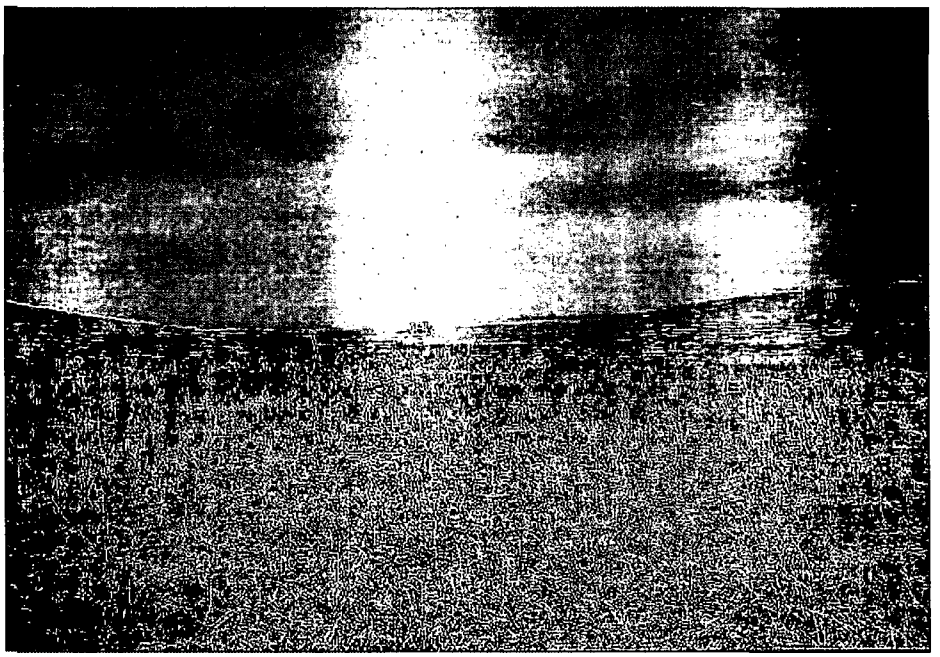
W35, R5 P11: Facing East, wetland



W35, R5 P12: Facing south, wetland



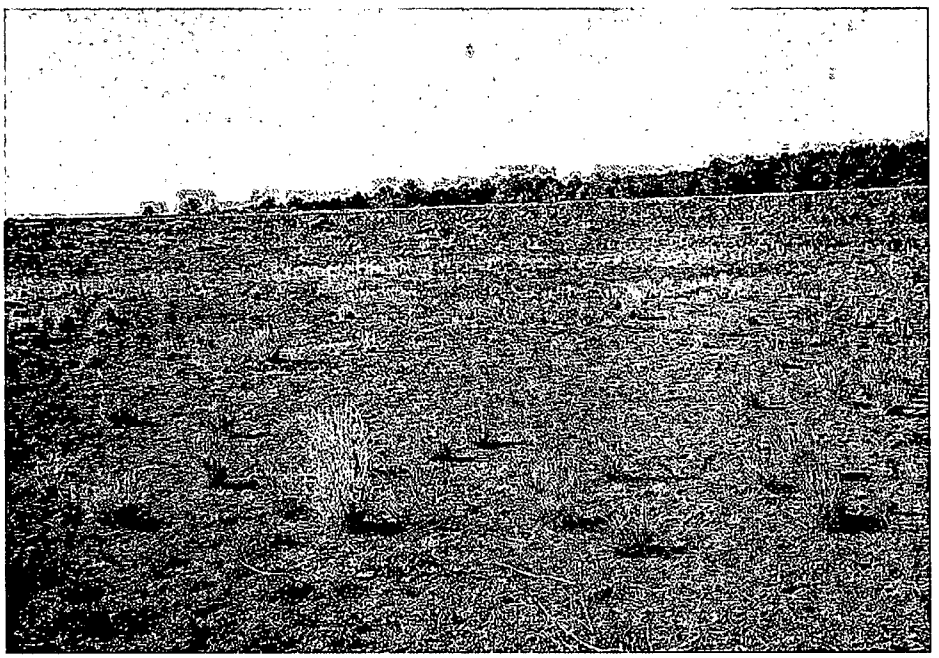
Wpt. 60 and 61, R5 P13: Depression, non-wetland



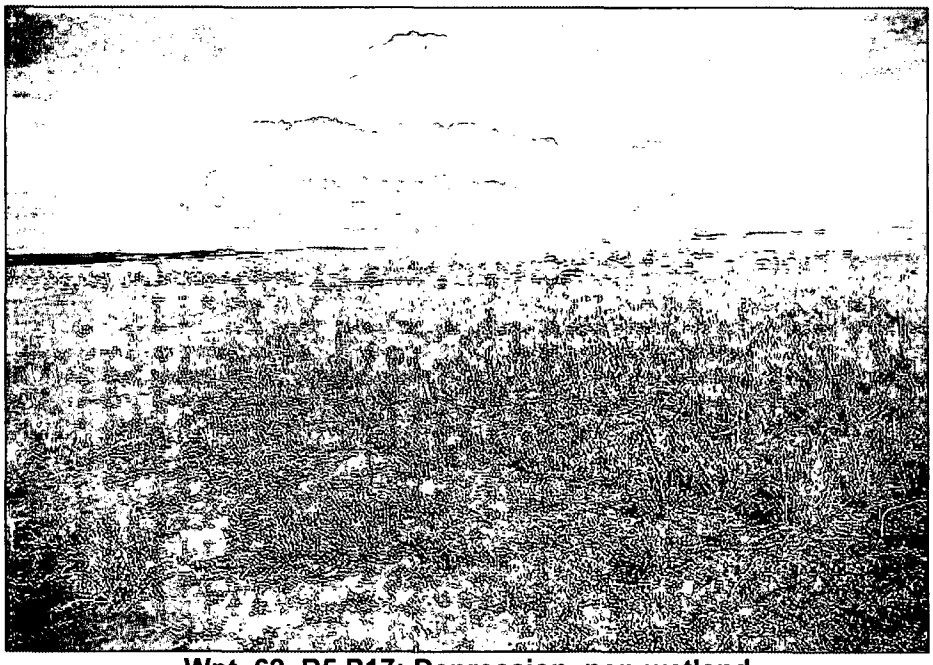
Wpt. 60 and 61, R5 P14: Depression, non-wetland



Wpt. 60 and 61, R5 P15: Depression w/ salt crusts, non-wetland



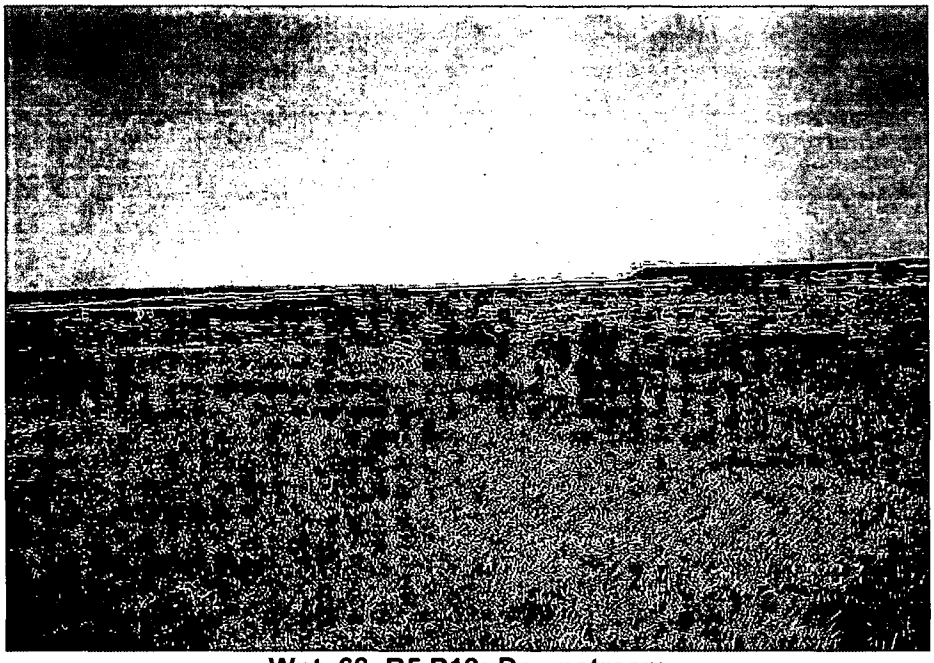
Wpt. 62, R5 P16: Depression, non-wetland



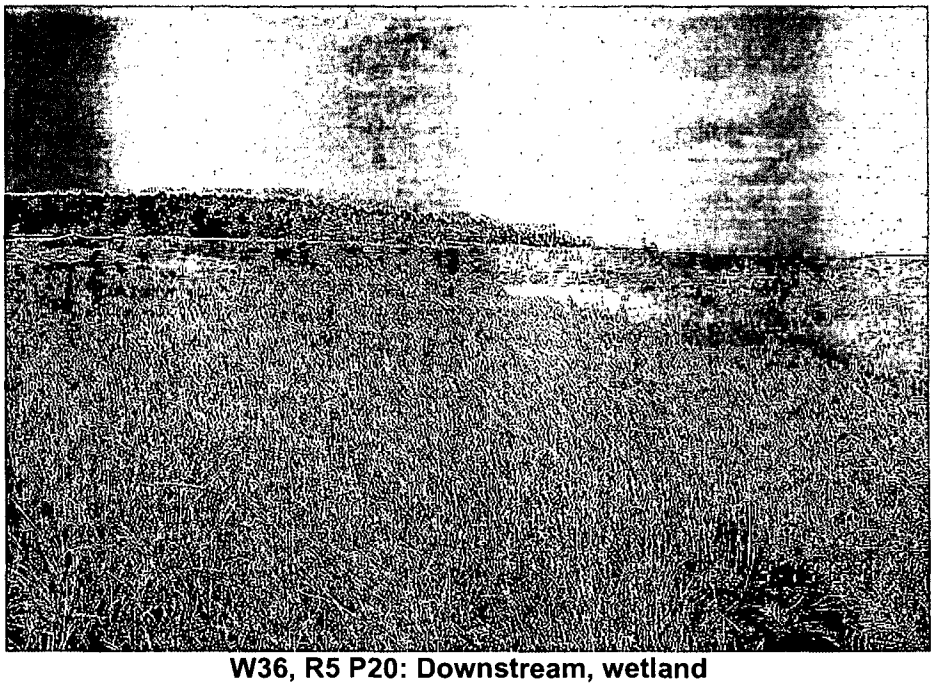
Wpt. 62, R5 P17: Depression, non-wetland



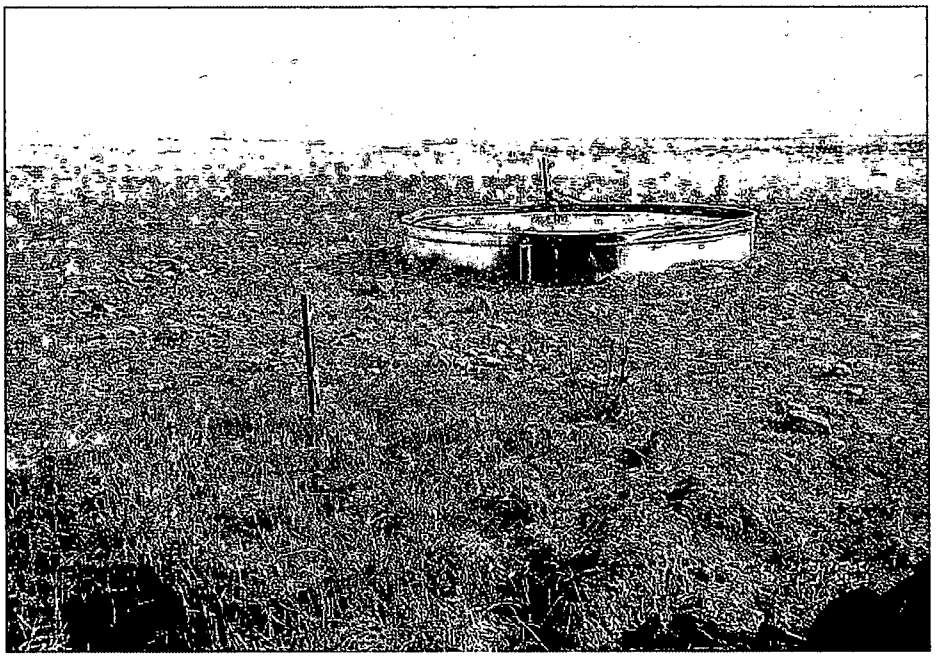
Wpt. 68, R5 P18: Upstream



Wpt. 68, R5 P19: Downstream



W36, R5 P20: Downstream, wetland



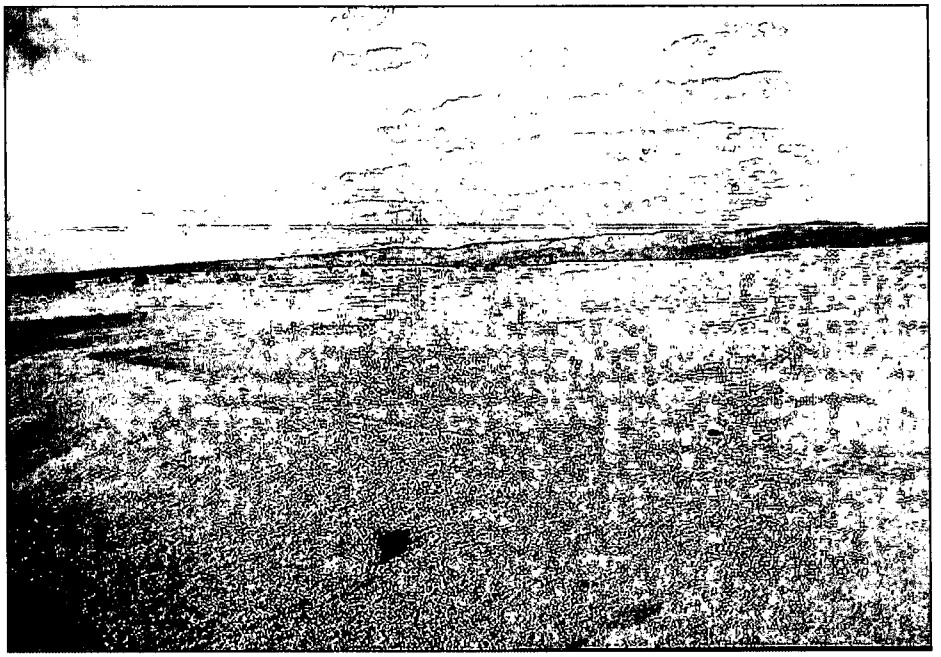
W36, R5 P21: Upstream to stock tank, wetland



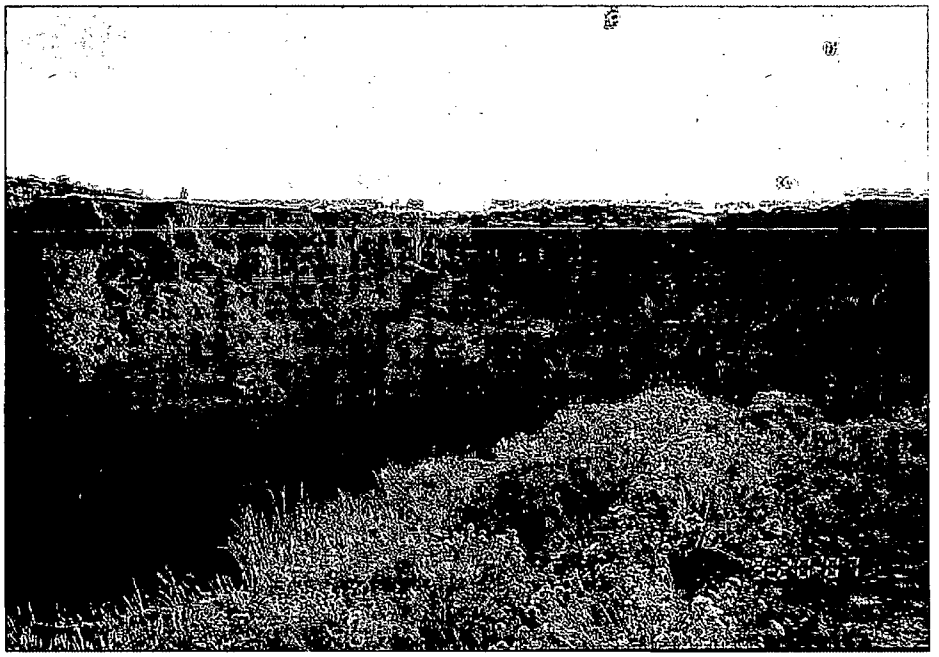
Wpt. 74, R6 P1: Depression, non-wetland



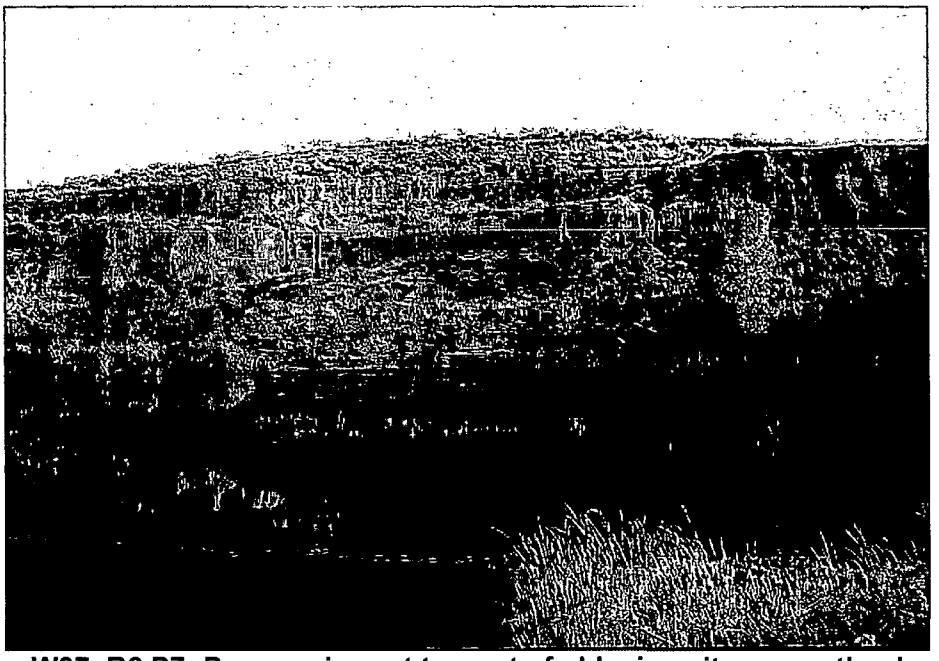
Wpt. 74, R6 P2: Depression, non-wetland



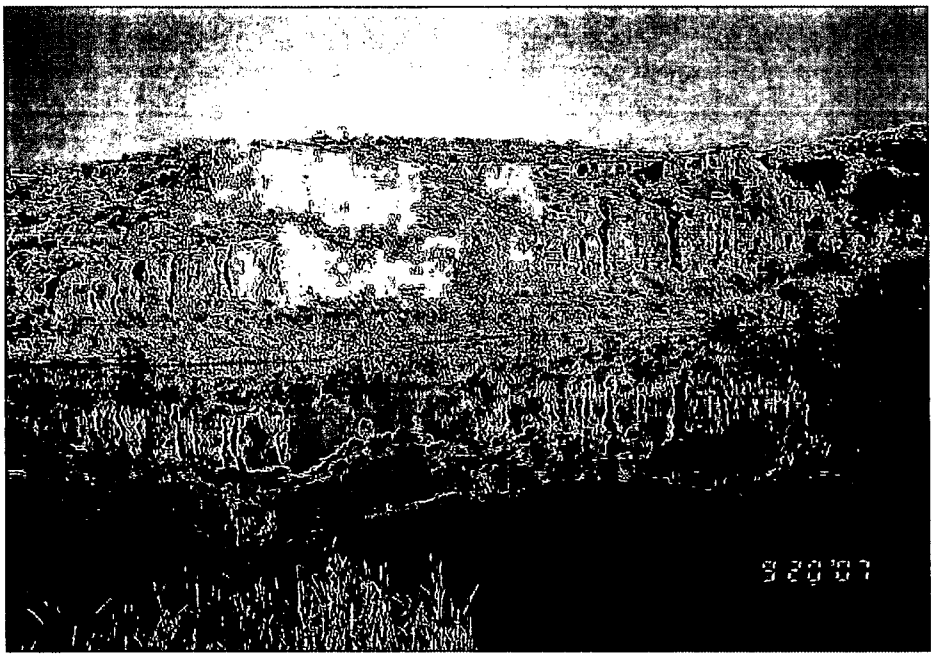
Wpt. 78, R6 P5: Depression, non-wetland



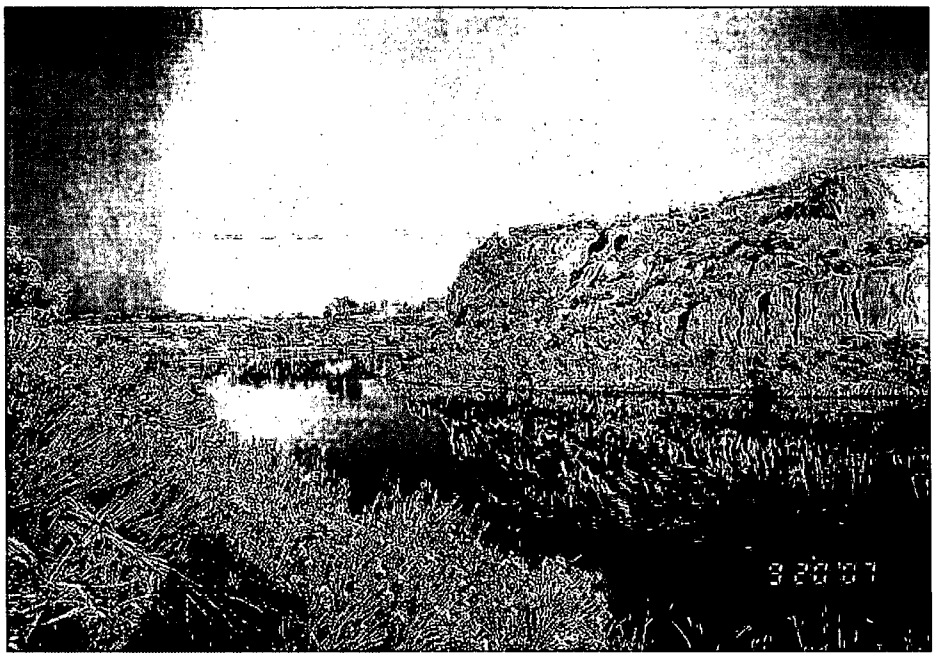
W37, R6 P6: Panoramic east to west of old mine pit, non-wetland



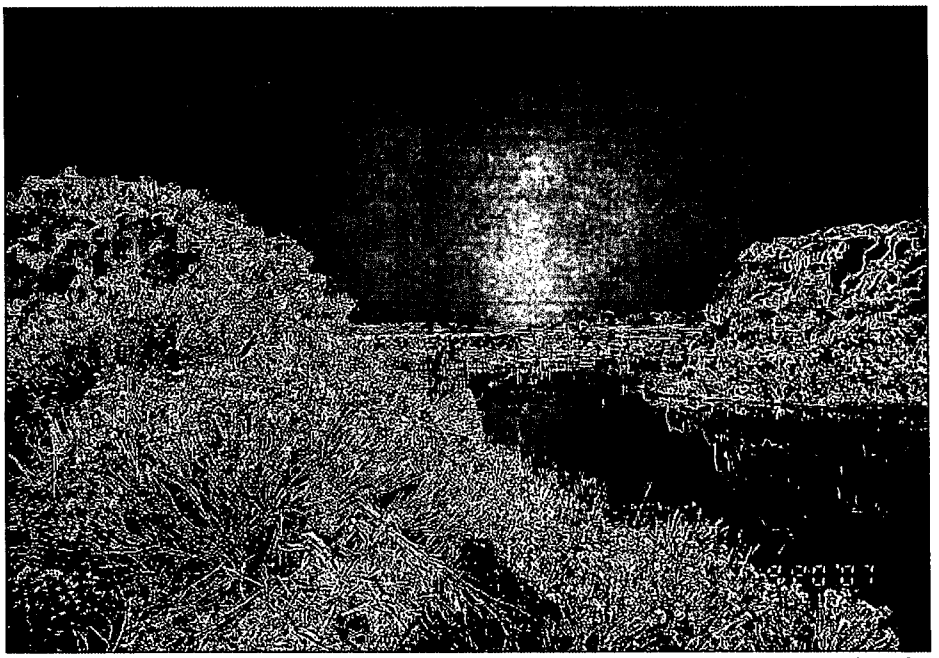
W37, R6 P7: Panoramic east to west of old mine pit, non-wetland



W37, R6 P8: Panoramic east to west of old mine pit, non-wetland



W37, R6 P9: Panoramic east to west of old mine pit, non-wetland



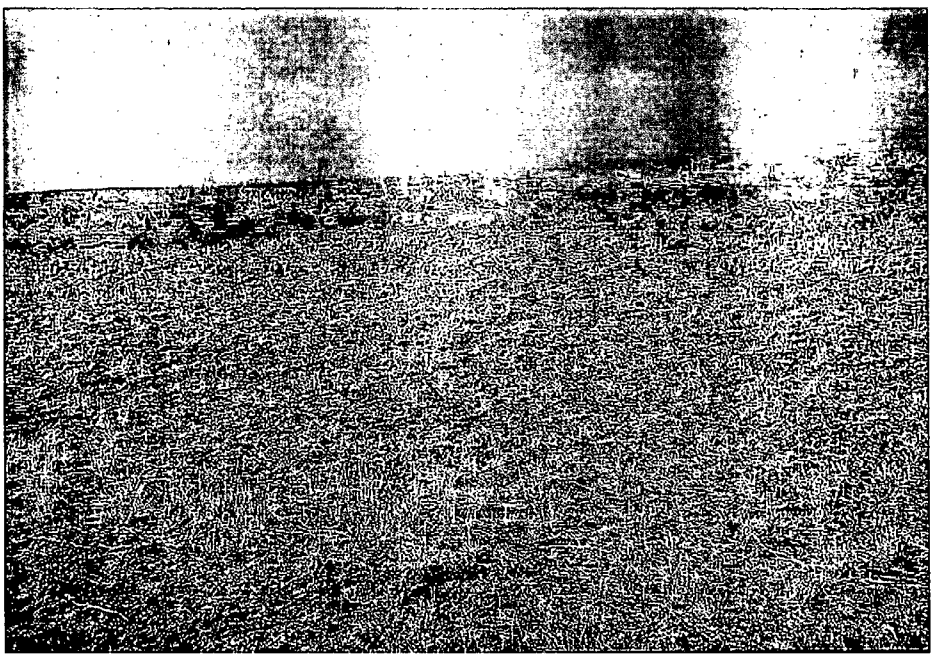
W37, R6 P10: Panoramic east to west of old mine pit, non-wetland



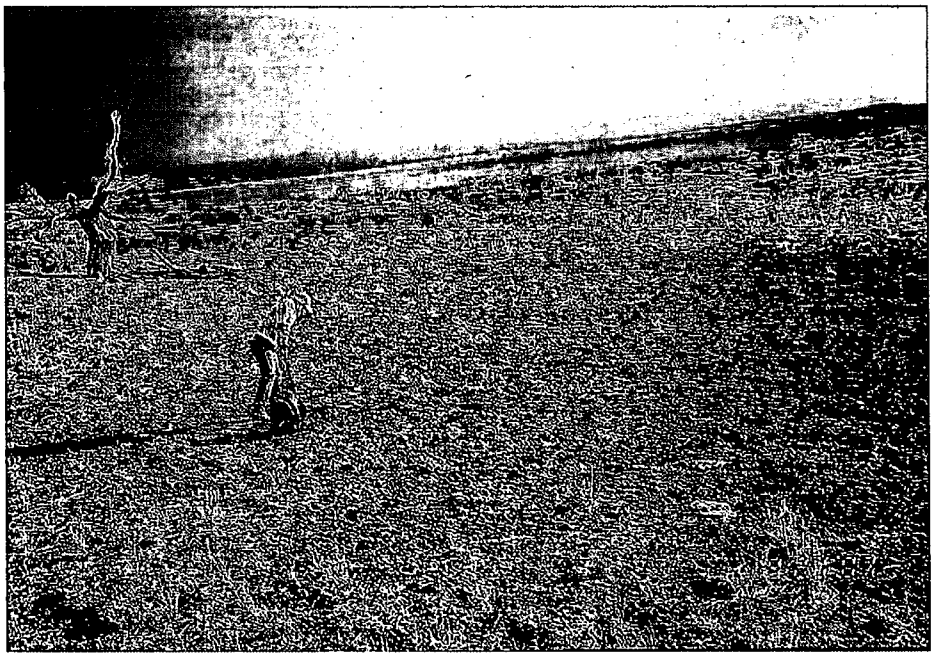
W38, R6 P13: East, wetland



W38, R6 P14: West, wetland



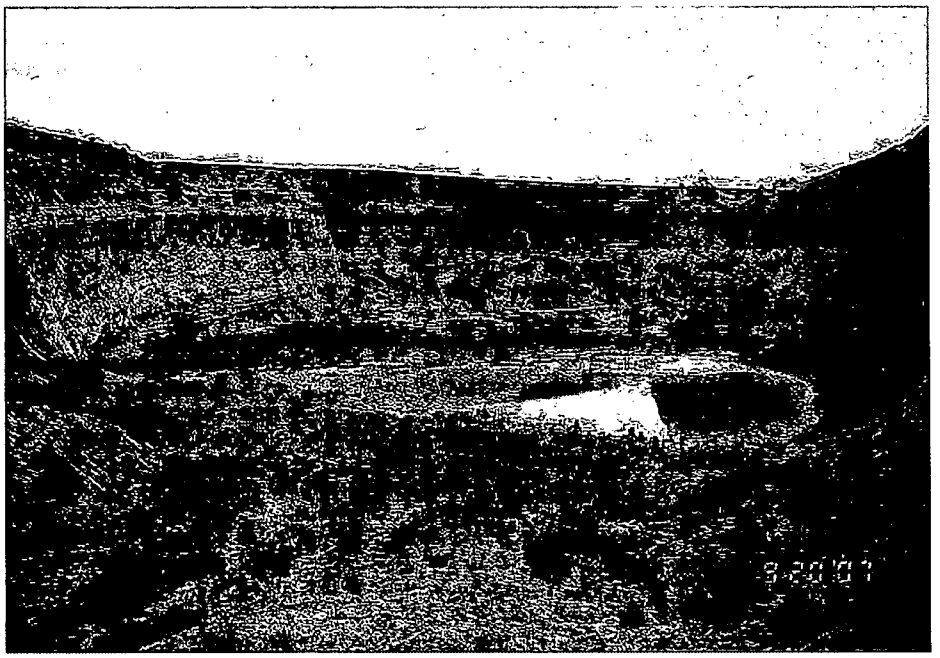
Wpt. 83, R6 P15: *Hordeum jubatum* depression, wetland



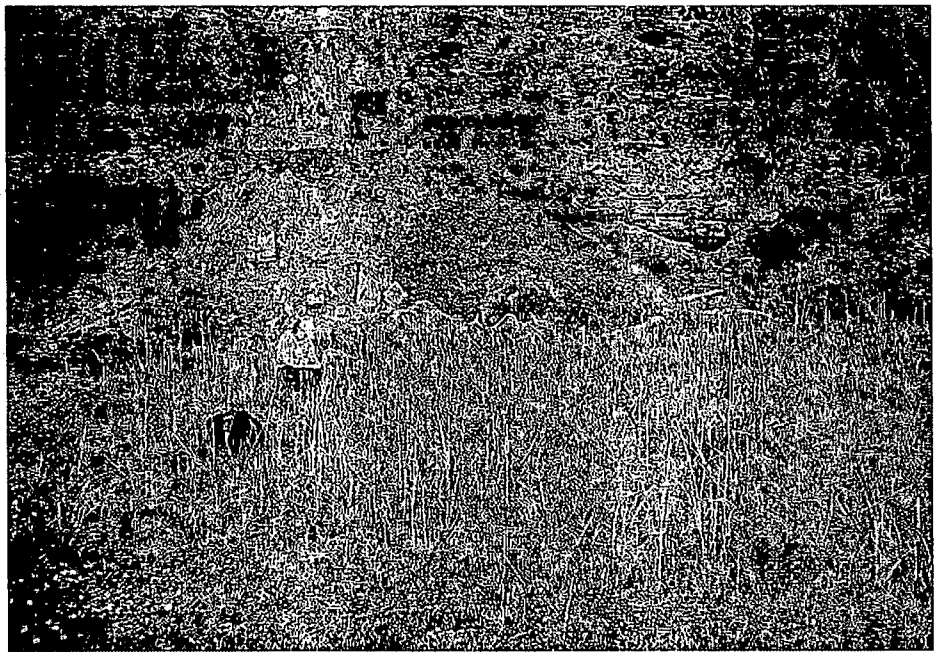
W39, R6 P16: Depression, wetland



W39, R6 P17: Drainage to the East, wetland



W40, R6 P18: Pond, wetland



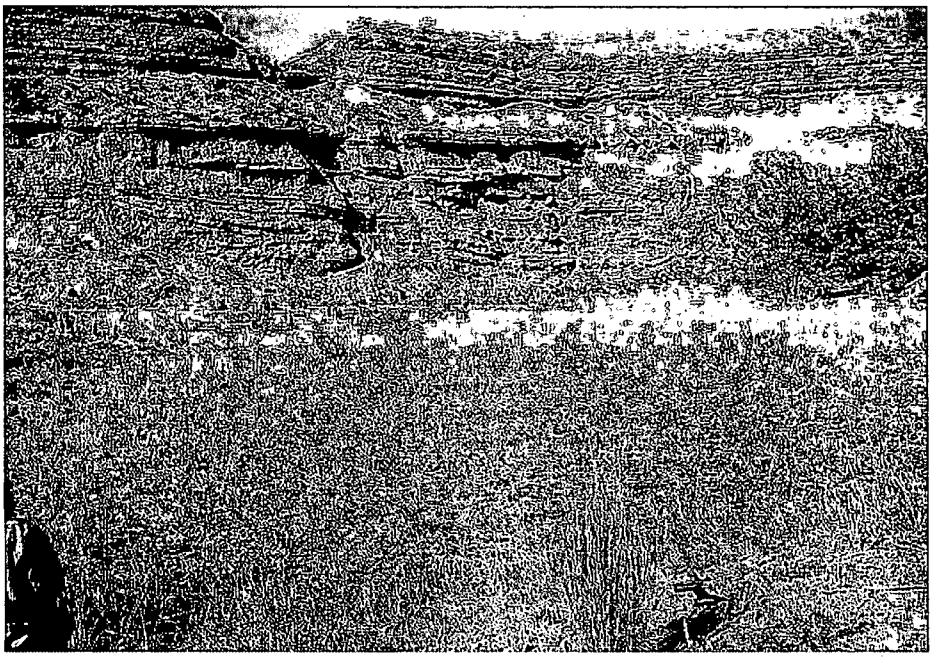
W41, R6 P19: Wetland



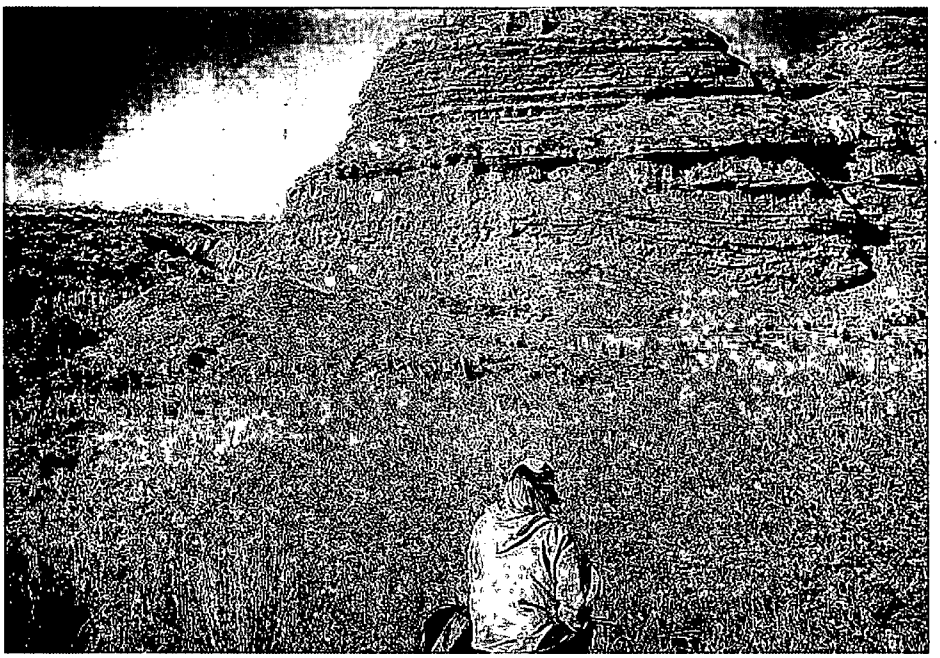
W41, R6 P20: General area, wetland



W42, R6 P22: Panoramic East to West, wetland



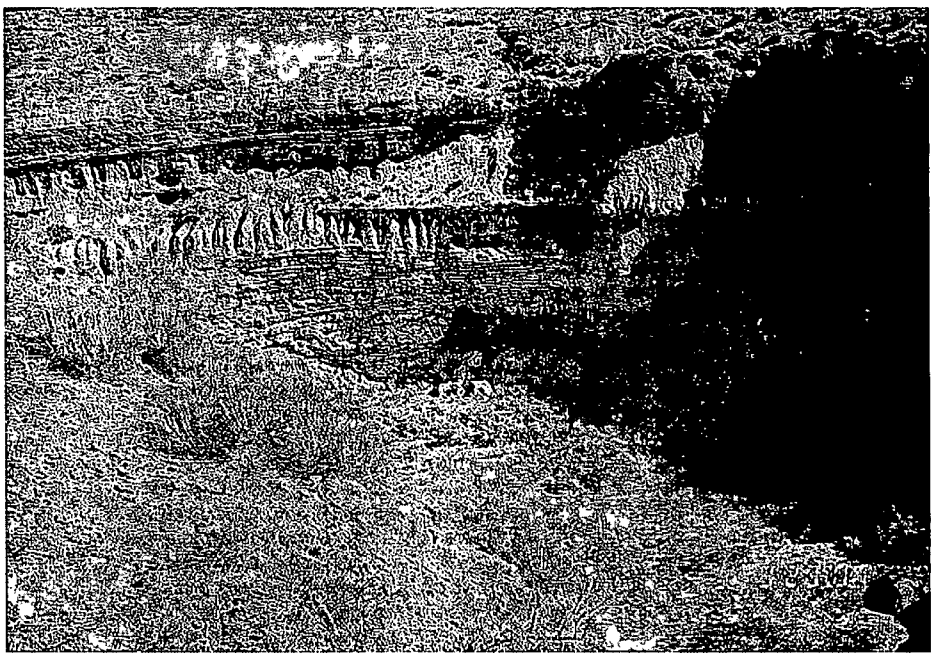
W42, R6 P23: Panoramic East to West, wetland



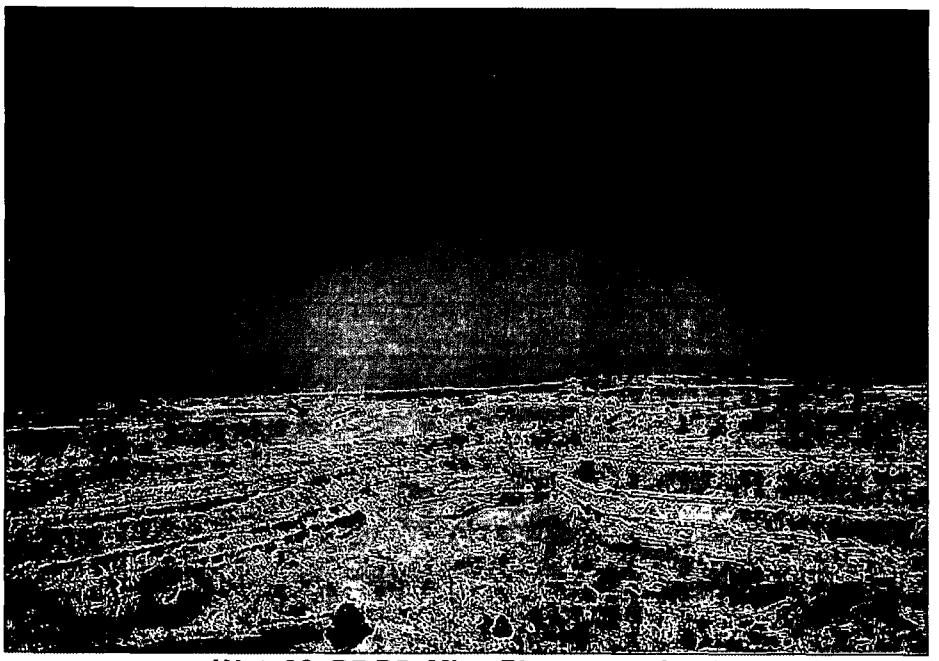
W42, R6 P24: Panoramic East to West, wetland



Wpt. 88 and 89, R7 P1: Mine Pit, non-wetland



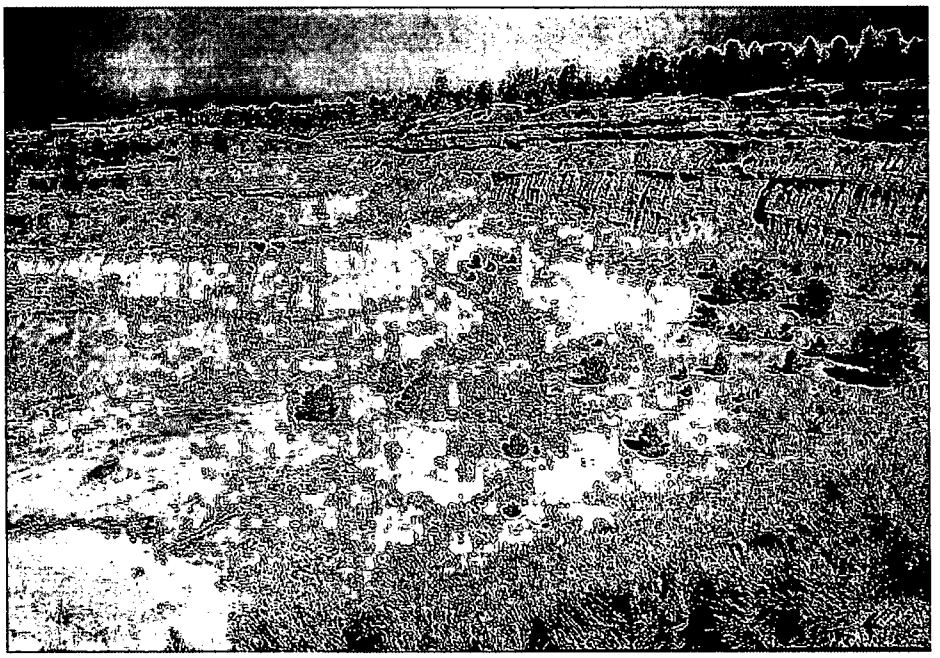
Wpt. 88 and 89, R7 P2: Mine Pit, non-wetland



Wpt. 92, R7 P5: Mine Pit, non-wetland



Wpt. 92, R7 P6: Mine Pit, non-wetland



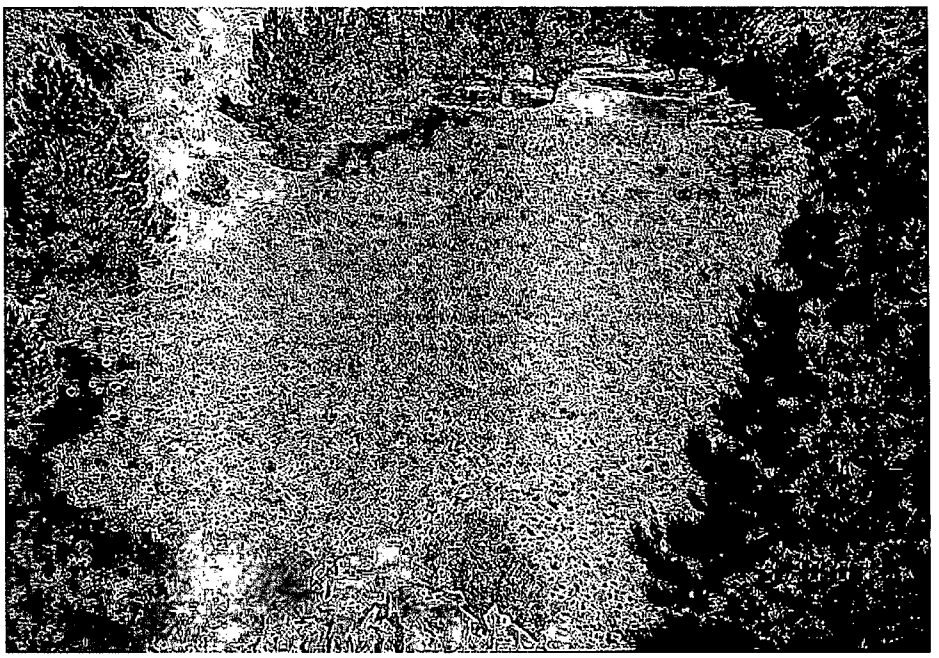
Wpt. 92, R7 P7: Mine Pit, non-wetland



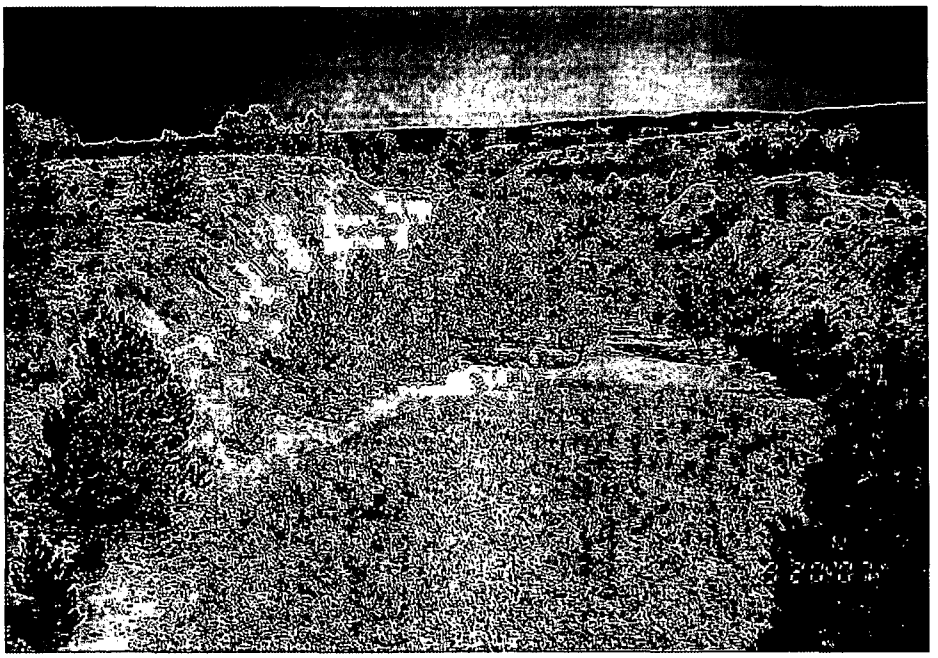
Wpt. 94, R7 P9: Mine Pit, non-wetland



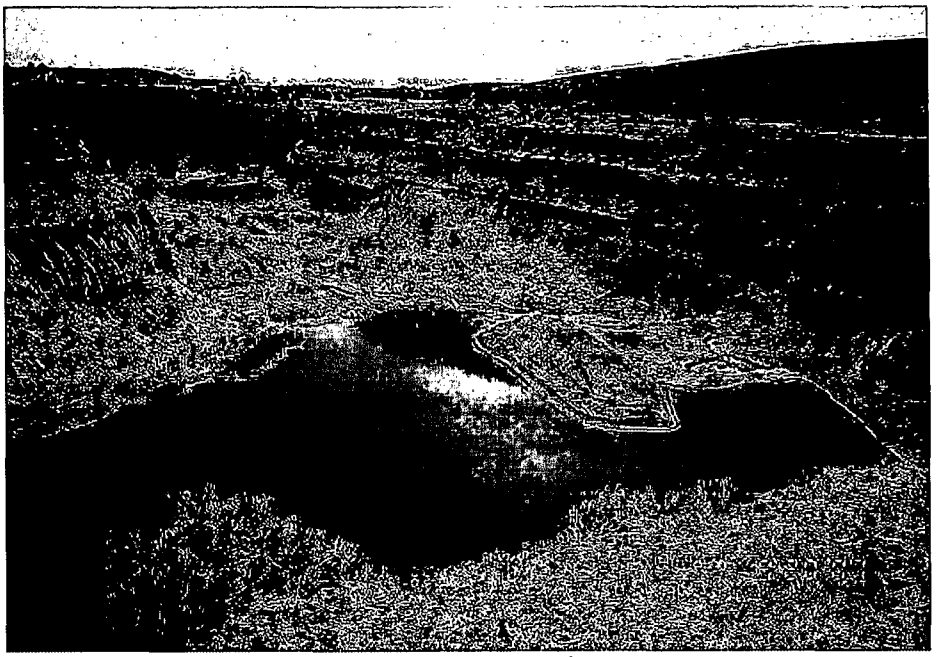
Wpt. 97, R7 P14: Depression, non-wetland



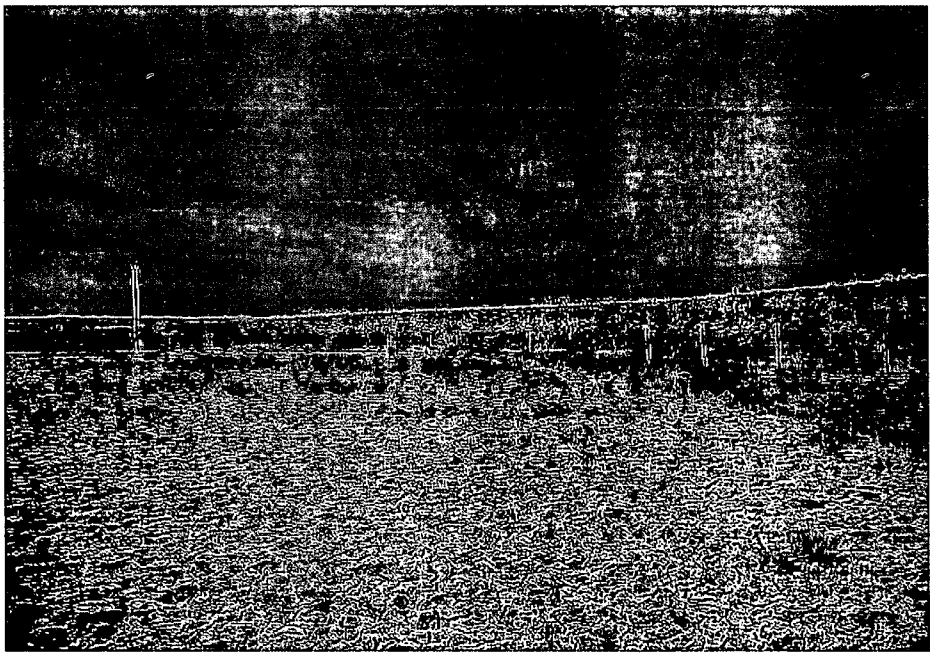
Wpt. 102, R7 P18: Depression, wetland



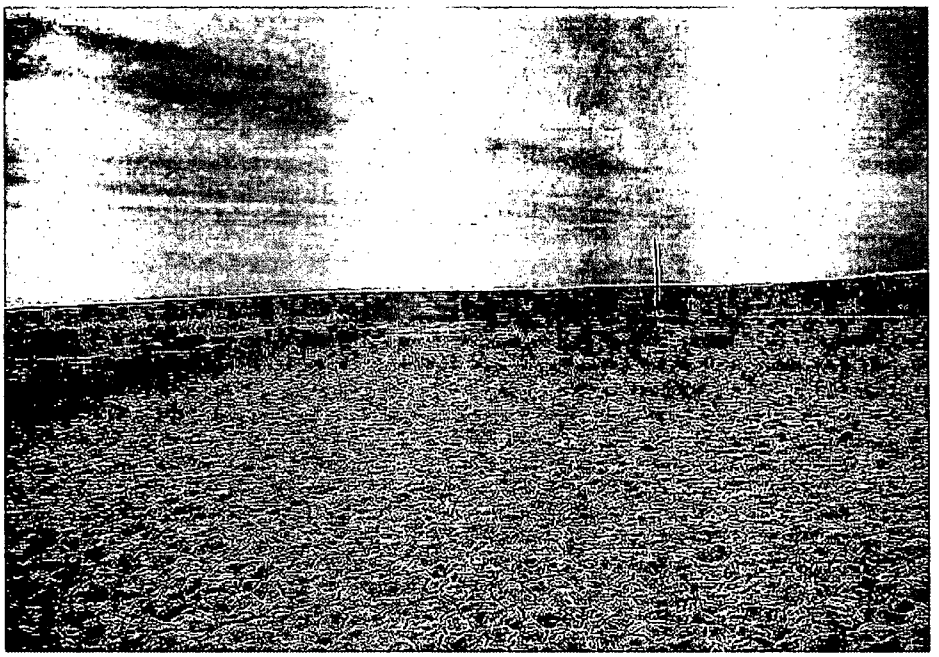
Wpt. 102, R7 P19: Depression, wetland



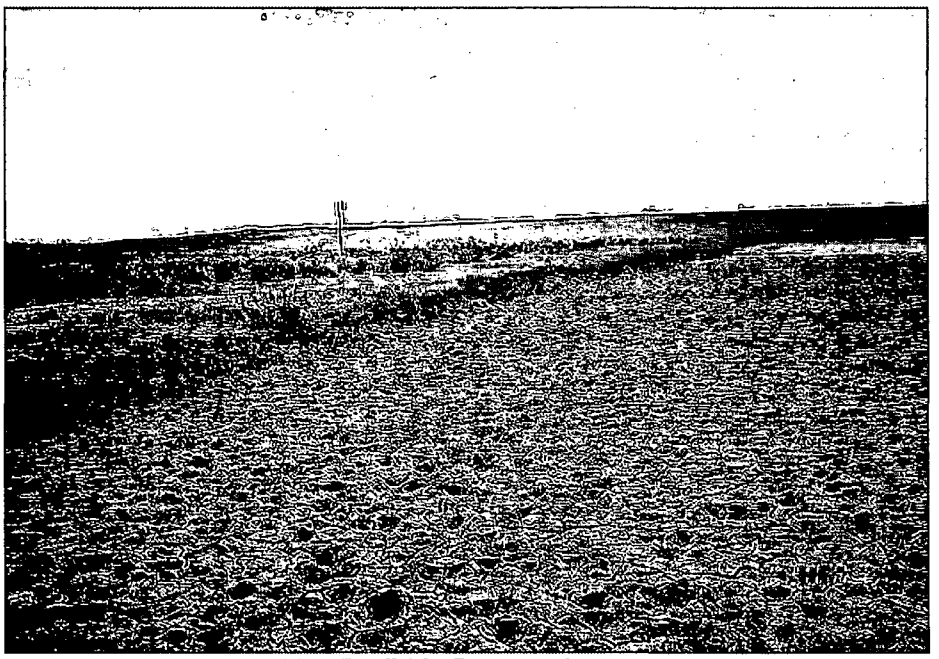
Wpt. 103, R7 P20: Mine Pit, wetland



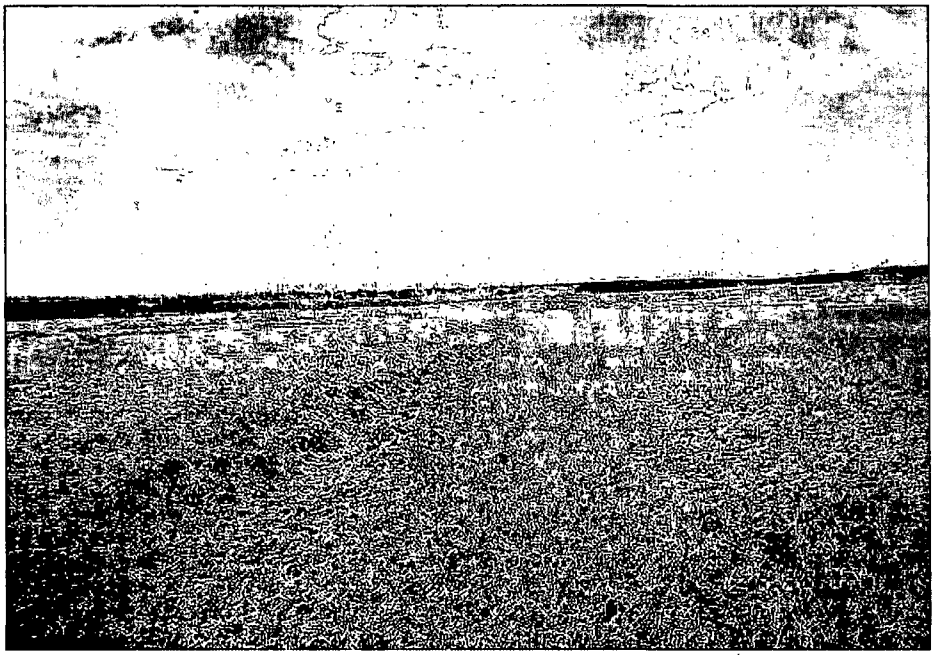
Wpt. 104, R7 P21: Depression, wetland



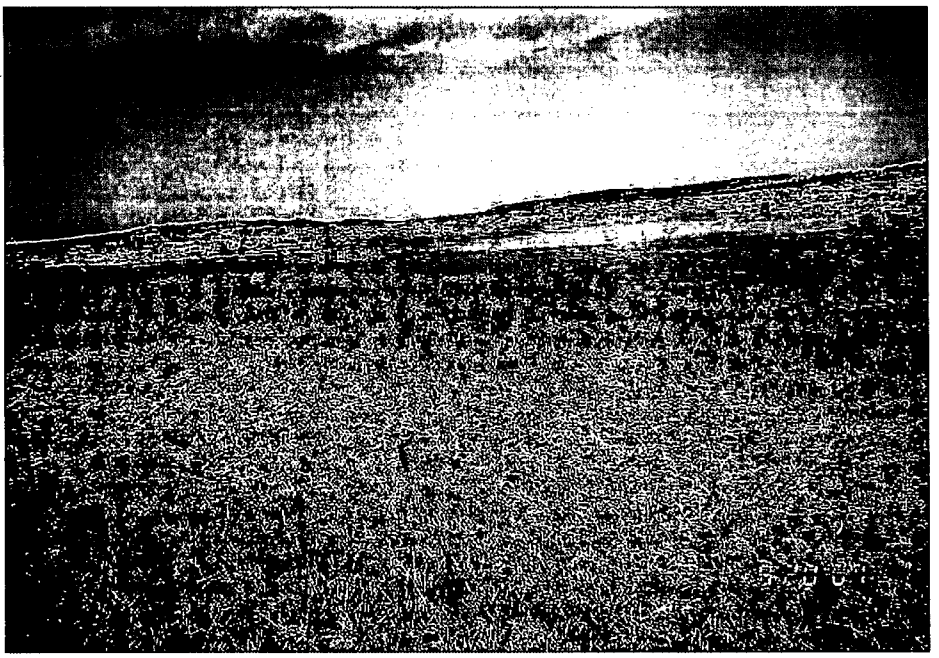
Wpt. 104, R7 P22: Depression, wetland



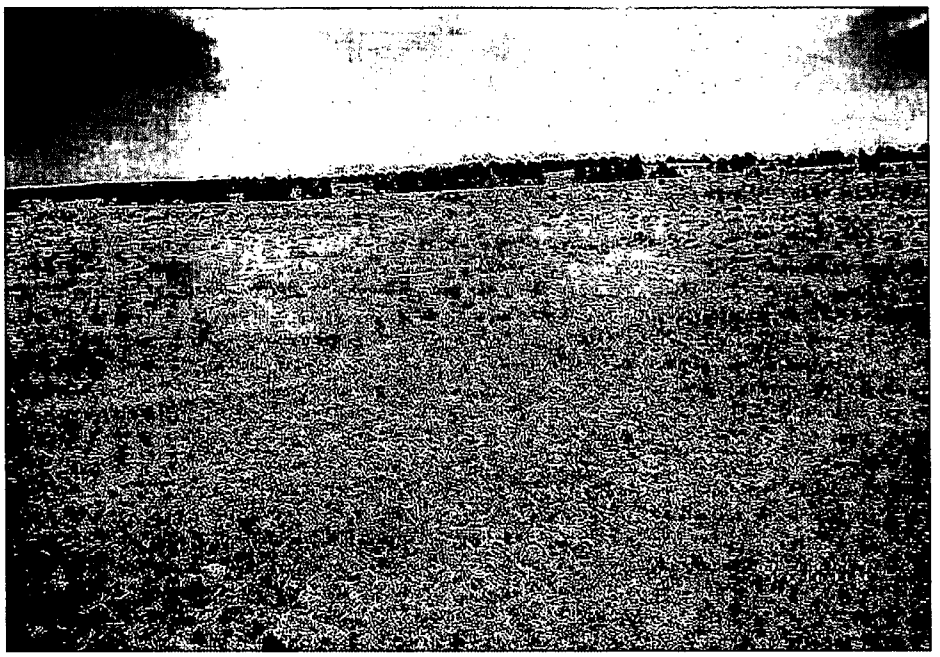
Wpt. 104, R7 P23: Depression, wetland



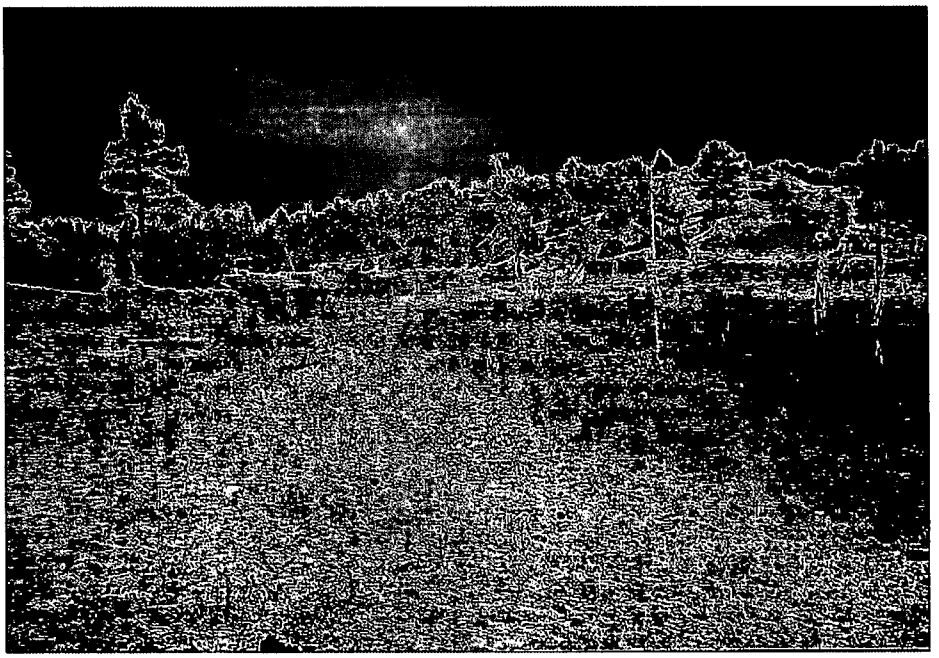
W44, R7 P24: Northwest, wetland



W44, R8 P1: North, wetland



W44, R8 P2: East, wetland



W45, R8 P4: Upstream, wetland



W45, R8 P5: Downstream, wetland

APPENDIX 3.5-G

WETLAND DETERMINATION DATA FORMS-GREAT PLAINS REGION (DRAFT)

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/17/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W1

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 32, T6S, R1E

Landform (hillslope, terrace, etc.) Depression into tributary | Local relief (concave, convex, none): Convex | Slope (%): 0%

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: PEMC

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ Naturally problematic? (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	
Hydric Soil Present?	Yes	X	No	
Wetland Hydrology Present	Yes		No	X

Is the Sampled Area Within a Wetland Yes X No

Remarks:
R1 P1 - Depression
~10' x 15'

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1. *Rosa woodsii*	100	X	FACU
2.			
3.			
4.			
5.			
Total Cover:	100		
Herb Stratum			
1. *Hordeum jubatum*	15		FACW
2. *Elymus smithii*	5		FACU
3. *Polygonum aviculare*	5		FACU
4. *Eleocharis palustris*	75	X	OBL
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum | % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	75	x1=	75
FACW species	15	x2=	30
FAC species		x3=	
FACU species	110	x4=	440
UPL species		x5=	
Column Totals:	200 (A)		545 (B)

Prevalence Index = B/A = 2.75

Hydrophytic Vegetation Indicators

___ Dominance Test is > 50%
X Prevalence Index is ≤ 3.0[1]
___ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

Remarks:

POWERTECH (USA) INC.

SOIL Sampling Point W1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	2.5Y 3/1	90	10YR 4/8	10	C	RC	SiCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____ 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 (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)
- ____ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ____ High Plains Depressions (F16)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) (**LRR C**)
- ____ Coast Prairie Redox (A16) (LRR F, G, H)
- ____ Dark Surface (S7) (**LRR G**)
- ____ High Plains Depressions (F16) (**LRR H outside 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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ 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 Leaves (B9)
- ____ Salt Crusts (B11)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Oder (C1)
- ____ Dry-Season Water Table (C2)
- ____ Presence of Reduced Iron (C4)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surfaces (B8)
- ____ Drainage Patterns (B10)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Frost-Heave Hummocks (C11) (**LRR F**)
- ____ Geomorphic Position (D2)
- ____ FAC-Neutral Test (D5)
- ____ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):	____	
Water Table Present?	Yes ____	No X	Depth (inches):	____	
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):	____	**Wetland Hydrology Present?** Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/17/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W2

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 32, T6S, R1E

Landform (hillslope, terrace, etc.) Drainage | Local relief (concave, convex, none): Convex | Slope (%): 3

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: R2EM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____ , Soil ____ , or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____ , Soil ____ , or Hydrology ____ Naturally problematic? (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		**Is the Sampled Area Within a Wetland** Yes X No
Hydric Soil Present?	Yes	X	No		
Wetland Hydrology Present	Yes	X	No		

Remarks:
Isolated wetland

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Hordeum jubatum*	10		FACW
2. *Elymus smithii*	15		FACU
3. *Spartina pectinata*	60	X	FACW
4. *Bromus japonicus*	5		FACU
5. *Xanthium strumarium*	2		FAC
6. *Poa pratensis*	3		FACU
7. *Melilotus officinalis*	5		FACU
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x1=	0
FACW species	70	x2=	140
FAC species	2	x3=	6
FACU species	28	x4=	112
UPL species	0	x5=	0
Column Totals:	100 (A)		258 (B)

Prevalence Index = B/A = 2.58

Hydrophytic Vegetation Indicators

X Dominance Test is > 50%

X Prevalence Index is ≤ 3.0[1]

___ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

Remarks:

SOIL Sampling Point W2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/1	95	7.5YR 3/3	5	C	M	C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ 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 (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ___ High Plains Depressions (F16)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside 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.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soils Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ 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 Leaves (B9)
- ___ Salt Crusts (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Oder (C1)
- ___ Dry-Season Water Table (C2)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- X Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surfaces (B8)
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Frost-Heave Hummocks (C11) (**LRR F**)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes	X	No		Depth (inches): 5
Water Table Present?	Yes		No	X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes		No	X	Depth (inches):

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

Soil is moist but not saturated. A definable channel is present.

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/17/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W3

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 32, T6S, R1E

Landform (hillslope, terrace, etc.) Drainage | Local relief (concave, convex, none): Convex | Slope (%): 0

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification:

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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		No	X
Hydric Soil Present?	Yes		No	X
Wetland Hydrology Present	Yes	X	No	

Is the Sampled Area Within a Wetland Yes ____ No X

Remarks:
R1 P 12: Upstream
R1 P13: Downstream

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Elymus smithii*	40	X	FACU
2. *Xanthium strumarium*	1		FAC
3. *Bromus japonicus*	20	X	FACU
4. *Polygonum aviculare*	5		FACU
5. *Lepidium densiflorum*	15		FACU
6. *Poa pratensis*	6		FACU
7. *Melilotus officinalis*	10		FACU-
8. *Symphoricarpos sp.*	3		NI
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 50 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:	
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

____ Dominance Test is > 50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

POWERTECH (USA) INC.

SOIL Sampling Point W3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/1	100					SiCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- _____ 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 (A11)
- _____ Thick Dark Surface (A12)
- _____ Sandy Mucky Mineral (S1)
- _____ 2.5 cm Mucky Peat or Peat (S2) **(LFF G, H)**
- _____ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- _____ Sandy Gleyed Matrix (S4)
- _____ Sandy Redox (S5)
- _____ Stripped Matrix (S6)
- _____ 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 (F16)

Indicators for Problematic Hydric Soils[3]:

- _____ 1 cm Muck (A9) **(LRR C)**
- _____ Coast Prairie Redox (A16) (LRR F, G, H)
- _____ Dark Surface (S7) **(LRR G)**
- _____ High Plains Depressions (F16) **(LRR H outside 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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- X Surface Water (A1)
- _____ High Water Table (A2)
- _____ 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 Leaves (B9)
- _____ Salt Crusts (B11)
- _____ Aquatic Invertebrates (B13)
- _____ Hydrogen Sulfide Oder (C1)
- _____ Dry-Season Water Table (C2)
- _____ Presence of Reduced Iron (C4)
- _____ Thin Muck Surface (C7)
- _____ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- X Surface Soil Cracks (B6)
- _____ Sparsely Vegetated Concave Surfaces (B8)
- X Drainage Patterns (B10)
- _____ Oxidized Rhizospheres on Living Roots (C3)
- _____ Crayfish Burrows (C8)
- _____ Saturation Visible on Aerial Imagery (C9)
- _____ Frost-Heave Hummocks (C11) **(LRR F)**
- X Geomorphic Position (D2)
- _____ FAC-Neutral Test (D5)
- _____ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes	X	No	_____	Depth (inches): _____
Water Table Present?	Yes	_____	No	X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes	_____	No	X	Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:
Definable channel is present.

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/17/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W4

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 32, T6S, R1E

Landform (hillslope, terrace, etc.) Drainage | Local relief (concave, convex, none): Convex | Slope (%): 3

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: R2EM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____ , Soil ____ , or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____ , Soil ____ , or Hydrology ____ Naturally problematic? (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		**Is the Sampled Area Within a Wetland** Yes X No
Hydric Soil Present?	Yes	X	No		
Wetland Hydrology Present	Yes	X	No		

Remarks:
R2 P2: Upstream R2 P3: Downstream R2 P4: Tributary
Channel width is approximately 17 feet
R2 P6: Upstream at waypoint 3 R2 P7: Downstream at waypoint 3
R2 P8 Upstream at waypoint 4 R2 P9: Downstream at waypoint 4

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Spartina pectinata*	35	X	FACW
2. *Cirsium arvense*	10		FACU
3. *Schoenoplectus pungens*	20	X	OBL
4. *Eleocharis palustris*	35	X	OBL
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum % Cover of Biotic Crust

Remarks:

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:	
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

X Dominance Test is > 50%
___ Prevalence Index is ≤ 3.0[1]
___ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

SOIL Sampling Point W4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	Gley1 2.5/N	100					SCL	
2-10	Gley1 3/N	100					SCL	
10-14	Gley1 4/5GY	95	7.5YR 4/6	5			SC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

	Histosol (A1)	X	Sandy Gleyed Matrix (S4)		1 cm Muck (A9) (**LRR C**)
	Histic Epipedon (A2)		Sandy Redox (S5)		Coast Prairie Redox (A16) (LRR F, G, H)
	Black Histic (A3)		Stripped 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 MLRA 72 & 73**)
X	1 cm Muck (A9) (**LRR F, G, H**)		Depleted Matrix (F3)		Reduced Vertic (F18)
	Depleted Below Dark Surface (A11)		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)		
X	2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)		High Plains Depressions (F16)		[3]Indicators of hydrophytic vegetation
	5 cm Mucky Peat or Peat (S3) (**LRR F**)				and wetland hydrology must be present.

Indicators for Problematic Hydric Soils[3]:

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soils Present? Yes X No

Remarks:
Faint hydrogen sulfide odor was present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

X	Surface Water (A1)		Salt Crusts (B11)		Surface Soil Cracks (B6)
X	High Water Table (A2)		Aquatic Invertebrates (B13)		Sparsely Vegetated Concave Surfaces (B8)
	Saturation (A3)		Hydrogen Sulfide Oder (C1)	X	Drainage Patterns (B10)
	Water Marks (B1)		Dry-Season Water Table (C2)		Oxidized Rhizospheres on Living Roots (C3)
	Sediment Deposits (B2)		Presence of Reduced Iron (C4)		Crayfish Burrows (C8)
X	Drift Deposits (B3)		Thin Muck Surface (C7)		Saturation Visible on Aerial Imagery (C9)
	Algal Mat or Crust (B4)		Other (Explain in Remark)		Frost-Heave Hummocks (C11) (**LRR F**)
	Iron Deposits (B5)			X	Geomorphic Position (D2)
	Inundation Visible on Aerial Imagery (B7)				FAC-Neutral Test (D5)
	Water Stained Leaves (B9)				Local Soil Survey Data (D8)

Secondary Indicators (2 or more required)

Field Observations:

Surface Water Present?	Yes	X	No		Depth (inches):
Water Table Present?	Yes	X	No		Depth (inches): 2
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches): 2

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/17/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W5

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 32, T6S, R1E

Landform (hillslope, terrace, etc.) Uplands | Local relief (concave, convex, none): None | Slope (%): 2

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification:

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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	____	No	X
Hydric Soil Present?	Yes	____	No	X
Wetland Hydrology Present	Yes		No	X

Is the Sampled Area Within a Wetland Yes ____ No X

Remarks:
R1 P5: Upland area near Beaver Creek

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Poa pratensis*	45	X	FACU
2. *Cirsium arvense*	15		FACU
3. *Chenopodium album*	25	X	FAC
4. *Helianthus annuus*	15		FACU
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 40 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species		x2=	
FAC species	25	x3=	75
FACU species	75	x4=	300
UPL species		x5=	
Column Totals:	100 (A)		375 (B)

Prevalence Index = B/A = 3.75

Hydrophytic Vegetation Indicators

____ Dominance Test is > 50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL Sampling Point W5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	100					SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____ 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 (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)
- ____ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ 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 (F16)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) (**LRR C**)
- ____ Coast Prairie Redox (A16) (LRR F, G, H)
- ____ Dark Surface (S7) (**LRR G**)
- ____ High Plains Depressions (F16) (**LRR H outside 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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ 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 Leaves (B9)
- ____ Salt Crusts (B11)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Oder (C1)
- ____ Dry-Season Water Table (C2)
- ____ Presence of Reduced Iron (C4)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surfaces (B8)
- ____ Drainage Patterns (B10)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Frost-Heave Hummocks (C11) (**LRR F**)
- ____ Geomorphic Position (D2)
- ____ FAC-Neutral Test (D5)
- ____ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/17/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W6

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 32, T6S, R1E

Landform (hillslope, terrace, etc.) Drainage | Local relief (concave, convex, none): convex | Slope (%): 2

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification:

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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		No	X	**Is the Sampled Area Within a Wetland** Yes ____ No X
Hydric Soil Present?	Yes		No	X	
Wetland Hydrology Present	Yes		No	X	

Remarks:
R1 P 17: Upstream
R1 P18: Downstream

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1. *Rosa woodsii*	100	X	FACU
2.			
3.			
4.			
5.			
Total Cover:	100		
Herb Stratum			
1. *Elymus smithii*	85	X	FACU
2. *Astragalus* sp.	5		UPL
3. *Nassella viridula*	5		NI
4. *Ratibida columnifera*	5		NI
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 30 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species		x2=	
FAC species		x3=	
FACU species	85	x4=	340
UPL species	5	x5=	25
Column Totals:	90	(A)	365 (B)

Prevalence Index = B/A = 4.05

Hydrophytic Vegetation Indicators

____ Dominance Test is > 50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL Sampling Point W6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 4/1	100					SiC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____ 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 (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)
- ____ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ 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 (F16)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) (**LRR C**)
- ____ Coast Prairie Redox (A16) (LRR F, G, H)
- ____ Dark Surface (S7) (**LRR G**)
- ____ High Plains Depressions (F16) (**LRR H outside 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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ 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 Leaves (B9)
- ____ Salt Crusts (B11)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Oder (C1)
- ____ Dry-Season Water Table (C2)
- ____ Presence of Reduced Iron (C4)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surfaces (B8)
- ____ Drainage Patterns (B10)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Frost-Heave Hummocks (C11) (**LRR F**)
- X Geomorphic Position (D2)
- ____ FAC-Neutral Test (D5)
- ____ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):	____	
Water Table Present?	Yes ____	No X	Depth (inches):	____	
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):	____	

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/17/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W7

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 32, T6S, R1E

Landform (hillslope, terrace, etc.) Drainage | Local relief (concave, convex, none): Convex | Slope (%): 2

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: R4SB7

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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		**Is the Sampled Area Within a Wetland** Yes X No
Hydric Soil Present?	Yes	X	No		
Wetland Hydrology Present	Yes	X	No		

Remarks:
R1 P17 Upstream
R1 P18 Downstream

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Elymus smithii*	5		FACU
2. *Cirsium arvense*	5		FACU
3. *Spartina pectinata*	75	X	FACW
4. *Helianthus annuus*	10		FACU
5. *Cynoglossum officinale*	5		NI
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:	
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

X Dominance Test is > 50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes ____ No ____

Remarks:

SOIL Sampling Point W7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/1	70	7.5 YR 4/6	30	C	RC	SiC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)	___ Sandy Gleyed Matrix (S4)	___ 1 cm Muck (A9) (**LRR C**)
___ Histic Epipedon (A2)	___ Sandy Redox (S5)	___ Coast Prairie Redox (A16) (LRR F, G, H)
___ Black Histic (A3)	___ Stripped 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 MLRA 72 & 73**)
___ 1 cm Muck (A9) (**LRR F, G, H**)	___ Depleted Matrix (F3)	___ Reduced Vertic (F18)
___ Depleted Below Dark Surface (A11)	___ Redox Dark Surface (F6)	___ Red Parent Material (TF2)
___ Thick Dark Surface (A12)	___ Depleted Dark Surface (F7)	___ Other (Explain in Remarks)
___ Sandy Mucky Mineral (S1)	X Redox Depressions (F8)	
___ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)	___ High Plains Depressions (F16)	[3]Indicators of hydrophytic vegetation
___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)		and wetland hydrology must be present.

Indicators for Problematic Hydric Soils[3]:

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)	___ Salt Crusts (B11)	___ Surface Soil Cracks (B6)
___ High Water Table (A2)	___ Aquatic Invertebrates (B13)	___ Sparsely Vegetated Concave Surfaces (B8)
___ Saturation (A3)	___ Hydrogen Sulfide Oder (C1)	___ Drainage Patterns (B10)
___ Water Marks (B1)	___ Dry-Season Water Table (C2)	X Oxidized Rhizospheres on Living Roots (C3)
___ Sediment Deposits (B2)	___ Presence of Reduced Iron (C4)	___ Crayfish Burrows (C8)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)	___ Saturation Visible on Aerial Imagery (C9)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remark)	___ Frost-Heave Hummocks (C11) (**LRR F**)
___ Iron Deposits (B5)		X Geomorphic Position (D2)
___ Inundation Visible on Aerial Imagery (B7)		___ FAC-Neutral Test (D5)
___ Water Stained Leaves (B9)		___ Local Soil Survey Data (D8)

Secondary Indicators (2 or more required)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___	
Water Table Present?	Yes ___	No X	Depth (inches):	___	
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	___	**Wetland Hydrology Present?** Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/17/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W8

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 31, T6S, R1E

Landform (hillslope, terrace, etc.) Drainage | Local relief (concave, convex, none): Convex | Slope (%): 1

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: R2EM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____ , Soil ____ , or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____ , Soil ____ , or Hydrology ____ Naturally problematic? (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		**Is the Sampled Area Within a Wetland** Yes X No
Hydric Soil Present?	Yes	X	No		
Wetland Hydrology Present	Yes	X	No		

Remarks:
R1 P19 Upstream
R1 P20 Downstream
Similar to W4 and all in between

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Spartina pectinata*	15		FACW
2. *Eleocharis palustris*	35	X	OBL
3. *Schoenoplectus pungens*	25	X	OBL
4. *Eleocharis acicularis*	25	X	OBL
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 40 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:	
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

X Dominance Test is > 50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

Remarks:

SOIL Sampling Point W8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	Gley1 3/10Y	70	7.5YR 4/4	20	C	M, RC	SC	
			2.5N	10	D	M	SC	
5+	Rock							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

	Histosol (A1)	X	Sandy Gleyed Matrix (S4)
	Histic Epipedon (A2)		Sandy Redox (S5)
	Black Histic (A3)		Stripped 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 (A11)		Redox Dark Surface (F6)
	Thick Dark Surface (A12)		Depleted Dark Surface (F7)
	Sandy Mucky Mineral (S1)		Redox Depressions (F8)
	2.5 cm Mucky Peat or Peat (S2) **(LFF G, H)**		High Plains Depressions (F16)
	5 cm Mucky Peat or Peat (S3) **(LRR F)**		

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) **(LRR C)**
- ____ Coast Prairie Redox (A16) (LRR F, G, H)
- ____ Dark Surface (S7) **(LRR G)**
- ____ High Plains Depressions (F16) **(LRR H outside 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.

Restrictive Layer (if present):

Type: ____

Depth (inches): ____

Hydric Soils Present? Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

X	Surface Water (A1)		Salt Crusts (B11)
	High Water Table (A2)		Aquatic Invertebrates (B13)
	Saturation (A3)		Hydrogen Sulfide Oder (C1)
	Water Marks (B1)		Dry-Season Water Table (C2)
	Sediment Deposits (B2)		Presence of Reduced Iron (C4)
	Drift Deposits (B3)		Thin Muck Surface (C7)
	Algal Mat or Crust (B4)		Other (Explain in Remark)
	Iron Deposits (B5)		
	Inundation Visible on Aerial Imagery (B7)		
	Water Stained Leaves (B9)		

Secondary Indicators (2 or more required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surfaces (B8)
- X Drainage Patterns (B10)
- X Oxidized Rhizospheres on Living Roots (C3)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Frost-Heave Hummocks (C11) **(LRR F)**
- X Geomorphic Position (D2)
- ____ FAC-Neutral Test (D5)
- ____ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches):	5	
Water Table Present?	Yes X	No ____	Depth (inches):	5	
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches):	5	

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/17/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W9

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 30-31, T6S R1E

Landform (hillslope, terrace, etc.) Drainage | Local relief (concave, convex, none): Convex | Slope (%):

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: PABJH

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____ , Soil ____ , or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____ , Soil ____ , or Hydrology ____ Naturally problematic? (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	
Hydric Soil Present?	Yes	X	No	
Wetland Hydrology Present	Yes	X	No	

Is the Sampled Area Within a Wetland Yes X No

Remarks:
R1 P23 Upstream
R1 P24 Downstream

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Xanthium strumarium*	40	X	FAC
2. *Suckleya suckleyanna*	60	X	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 50 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:	
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

X Dominance Test is > 50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

Remarks:

SOIL Sampling Point W9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/1	50	5YR 4/6	50	C	RC/M	C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____ 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 (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)
- ____ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ____ High Plains Depressions (F16)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) (**LRR C**)
- ____ Coast Prairie Redox (A16) (LRR F, G, H)
- ____ Dark Surface (S7) (**LRR G**)
- ____ High Plains Depressions (F16) (**LRR H outside 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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ 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 Leaves (B9)
- ____ Salt Crusts (B11)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Oder (C1)
- ____ Dry-Season Water Table (C2)
- ____ Presence of Reduced Iron (C4)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surfaces (B8)
- ____ Drainage Patterns (B10)
- X Oxidized Rhizospheres on Living Roots (C3)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Frost-Heave Hummocks (C11) (**LRR F**)
- X Geomorphic Position (D2)
- ____ FAC-Neutral Test (D5)
- ____ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):	____	
Water Table Present?	Yes ____	No X	Depth (inches):	____	
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):	____	**Wetland Hydrology Present?** Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

Slight soil cracks were present.

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/17/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W10

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 32, T6S, R1E

Landform (hillslope, terrace, etc.) Drainage/ Depression | Local relief (concave, convex, none): Convex | Slope (%):

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: PUSA

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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		No	X
Hydric Soil Present?	Yes	X	No	
Wetland Hydrology Present	Yes	X	No	

Is the Sampled Area Within a Wetland Yes X No

Remarks:
NWI previously mapped: PEMF
R2 P1: Downstream
R2 P2: Upstream
Transitioning area changing to an upland area.

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Carex filifolia*	80	X	UPL
2. *Hordeum jubatum*	20	X	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species	20	x2=	40
FAC species		x3=	
FACU species		x4=	
UPL species	80	x5=	400
Column Totals:	100 (A)		440 (B)

Prevalence Index = B/A = 4.40

Hydrophytic Vegetation Indicators

____ Dominance Test is > 50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

POWERTECH (USA) INC.

SOIL Sampling Point W10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 4/1	75	5YR 5/8	25	C	RC	C	
5-9	10YR 4/1	93	10YR 5/8	7	C	M	C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)	___ Sandy Gleyed Matrix (S4)	___ 1 cm Muck (A9) (**LRR C**)
___ Histic Epipedon (A2)	___ Sandy Redox (S5)	___ Coast Prairie Redox (A16) (LRR F, G, H)
___ Black Histic (A3)	___ Stripped 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 MLRA 72 & 73**)
___ 1 cm Muck (A9) (**LRR F, G, H**)	X Depleted Matrix (F3)	___ Reduced Vertic (F18)
___ Depleted Below Dark Surface (A11)	___ Redox Dark Surface (F6)	___ Red Parent Material (TF2)
___ Thick Dark Surface (A12)	___ Depleted Dark Surface (F7)	___ Other (Explain in Remarks)
___ Sandy Mucky Mineral (S1)	X Redox Depressions (F8)	
___ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)	___ High Plains Depressions (F16)	[3]Indicators of hydrophytic vegetation
___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)		and wetland hydrology must be present.

Indicators for Problematic Hydric Soils[3]:

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes X No ___

Remarks:

A few oxidized root channels existed, with a greater percentage in the top five inches.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)	___ Salt Crusts (B11)
___ High Water Table (A2)	___ Aquatic Invertebrates (B13)
___ Saturation (A3)	___ Hydrogen Sulfide Oder (C1)
___ Water Marks (B1)	___ Dry-Season Water Table (C2)
___ Sediment Deposits (B2)	___ Presence of Reduced Iron (C4)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remark)
___ Iron Deposits (B5)	
___ Inundation Visible on Aerial Imagery (B7)	
___ Water Stained Leaves (B9)	

Secondary Indicators (2 or more required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surfaces (B8)
___ Drainage Patterns (B10)
X Oxidized Rhizospheres on Living Roots (C3)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Frost-Heave Hummocks (C11) (**LRR F**)
X Geomorphic Position (D2)
___ FAC-Neutral Test (D5)
___ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/18/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W11

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 32, T6S, R1E

Landform (hillslope, terrace, etc.) Drainage | Local relief (concave, convex, none): Convex | Slope (%): 1

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification:

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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		No	X	**Is the Sampled Area Within a Wetland** Yes ____ No X
Hydric Soil Present?	Yes		No	X	
Wetland Hydrology Present	Yes		No	X	

Remarks:
NWI previously mapped: PEMF
Cottonwoods in area but not in five foot radius
R2 P3: West
R2 P4: East

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Bassia sieveriana*	70	X	FACU
2. *Hordeum jubatum*	5		FACW
3. *Chenopodium album*	15		FAC
4. *Cirsium arvense*	5		FACU
5. *Thlaspi arvense*	5		FACU
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 40 % Cover of Biotic Crust

Remarks:

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species	5	x2=	10
FAC species	15	x3=	45
FACU species	80	x4=	320
UPL species		x5=	
Column Totals:	100 (A)		375 (B)

Prevalence Index = B/A = 3.75

Hydrophytic Vegetation Indicators

____ Dominance Test is > 50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes ____ No X

SOIL Sampling Point W11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 4/1	100					SiC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____ 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 (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)
- ____ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ 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 (F16)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) (**LRR C**)
- ____ Coast Prairie Redox (A16) (LRR F, G, H)
- ____ Dark Surface (S7) (**LRR G**)
- ____ High Plains Depressions (F16) (**LRR H outside 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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ 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 Leaves (B9)
- ____ Salt Crusts (B11)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Oder (C1)
- ____ Dry-Season Water Table (C2)
- ____ Presence of Reduced Iron (C4)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surfaces (B8)
- ____ Drainage Patterns (B10)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Frost-Heave Hummocks (C11) (**LRR F**)
- X Geomorphic Position (D2)
- ____ FAC-Neutral Test (D5)
- ____ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):	____	
Water Table Present?	Yes ____	No X	Depth (inches):	____	
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):	____	

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/18/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W12

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 32, T6S, R1E

Landform (hillslope, terrace, etc.) Drainage | Local relief (concave, convex, none): Convex | Slope (%): 1

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification:

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____ , Soil ____ , or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____ , Soil ____ , or Hydrology ____ Naturally problematic? (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		No	X
Hydric Soil Present?	Yes	X	No	
Wetland Hydrology Present	Yes		No	X

Is the Sampled Area Within a Wetland Yes ____ No X

Remarks:
NWI previously mapped: PEMF
R2 P5: West
R2 P6: East

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Spartina pectinata*	5		FACW
2. *Chenopodium album*	50	X	FAC
3. *Cirsium arvense*	15		FACU
4. *Thlaspi arvense*	30	X	FACU
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 30 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species	5	x2=	10
FAC species	50	x3=	150
FACU species	45	x4=	180
UPL species		x5=	
Column Totals:	100 (A)		340 (B)

Prevalence Index = B/A = 3.40

Hydrophytic Vegetation Indicators

____ Dominance Test is > 50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL Sampling Point W12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 4/1	75	10YR 5/8	25	C	M	C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)	___ Sandy Gleyed Matrix (S4)	___ 1 cm Muck (A9) (**LRR C**)
___ Histic Epipedon (A2)	___ Sandy Redox (S5)	___ Coast Prairie Redox (A16) (LRR F, G, H)
___ Black Histic (A3)	___ Stripped Matrix (S6)	___ Dark Surface (S7) (**LRR G**)
___ Hydrogen Sulfide (A4)	___ Loamy Mucky Mineral (F1)	___ High Plains Depressions (F16) (**LRR H outside MLRA 72 & 73**)
___ Stratified Layers (A5) (**LRR F**)	___ Loamy Gleyed Matrix (F2)	
___ 1 cm Muck (A9) (**LRR F, G, H**)	X Depleted Matrix (F3)	___ Reduced Vertic (F18)
___ Depleted Below Dark Surface (A11)	___ Redox Dark Surface (F6)	___ Red Parent Material (TF2)
___ Thick Dark Surface (A12)	___ Depleted Dark Surface (F7)	___ Other (Explain in Remarks)
___ Sandy Mucky Mineral (S1)	X Redox Depressions (F8)	
___ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)	___ High Plains Depressions (F16)	[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.
___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)		

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)	___ Salt Crusts (B11)	**Secondary Indicators (2 or more required)**
___ High Water Table (A2)	___ Aquatic Invertebrates (B13)	___ Surface Soil Cracks (B6)
___ Saturation (A3)	___ Hydrogen Sulfide Oder (C1)	___ Sparsely Vegetated Concave Surfaces (B8)
___ Water Marks (B1)	___ Dry-Season Water Table (C2)	___ Drainage Patterns (B10)
___ Sediment Deposits (B2)	___ Presence of Reduced Iron (C4)	___ Oxidized Rhizospheres on Living Roots (C3)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)	___ Crayfish Burrows (C8)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remark)	___ Saturation Visible on Aerial Imagery (C9)
___ Iron Deposits (B5)		___ Frost-Heave Hummocks (C11) (**LRR F**)
___ Inundation Visible on Aerial Imagery (B7)		X Geomorphic Position (D2)
___ Water Stained Leaves (B9)		___ FAC-Neutral Test (D5)
		___ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___	
Water Table Present?	Yes ___	No X	Depth (inches):	___	**Wetland Hydrology Present?** Yes ___ No X
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	___	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/18/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W13

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 32, T6S, R1E

Landform (hillslope, terrace, etc.) Drainage | Local relief (concave, convex, none): Convex | Slope (%): 1

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: R4US

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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		
Hydric Soil Present?	Yes		No	X	**Is the Sampled Area Within a Wetland** Yes X No
Wetland Hydrology Present	Yes	X	No		

Remarks:
Just North of the area little bluestem is creeping into the drainage but it is still dominated by *Spartina pectinata*.

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Spartina pectinata*	90	X	FACW
2. *Andropogon scoparius*	5		NI
3. *Chenopodium album*	5		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:	
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

X Dominance Test is > 50%

___ Prevalence Index is ≤ 3.0[1]

___ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

Remarks:

SOIL Sampling Point W13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/1	50	7.5YR 5/8	50	C	M	SiCL	
4-10	10YR 4/1	100					SiCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____ 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 (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)
- ____ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ 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 (F16)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) (**LRR C**)
- ____ Coast Prairie Redox (A16) (LRR F, G, H)
- ____ Dark Surface (S7) (**LRR G**)
- ____ High Plains Depressions (F16) (**LRR H outside 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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes ____ No X

Remarks:
There were small inclusions of mottles present in depths 4-10 in the matrix.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ 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 Leaves (B9)
- ____ Salt Crusts (B11)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Oder (C1)
- ____ Dry-Season Water Table (C2)
- ____ Presence of Reduced Iron (C4)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surfaces (B8)
- X Drainage Patterns (B10)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Frost-Heave Hummocks (C11) (**LRR F**)
- X Geomorphic Position (D2)
- ____ FAC-Neutral Test (D5)
- ____ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):	____	
Water Table Present?	Yes ____	No X	Depth (inches):	____	
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):	____	**Wetland Hydrology Present?** Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/18/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W14

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 32, T6S, R1E

Landform (hillslope, terrace, etc.) Drainage | Local relief (concave, convex, none): Convex | Slope (%): 1

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: R4US

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____ , Soil ____ , or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____ , Soil ____ , or Hydrology ____ Naturally problematic? (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		**Is the Sampled Area Within a Wetland** Yes X No
Hydric Soil Present?	Yes	X	No		
Wetland Hydrology Present	Yes	X	No		

Remarks:
R2 P7: Upstream area extends from waypoints 015-019
R2P8: Downstream
R2 P9: General area of PEMC

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Spartina pectinata*	40	X	FACW
2. *Typha latifolia*	20	X	OBL
3. *Juncus balticus*	40	X	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x1=	20
FACW species	80	x2=	160
FAC species		x3=	
FACU species		x4=	
UPL species		x5=	
Column Totals:	100 (A)		180 (B)
Prevalence Index = B/A =			1.80

Hydrophytic Vegetation Indicators

X Dominance Test is > 50%
X Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	Gley1 4/N	55	7.5YR 5/8	45	C	RC	SiCL	
4-14	Gley1 4/N	80	7.5YR 4/6	20	C	M	SiCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)	___ Sandy Gleyed Matrix (S4)	___ 1 cm Muck (A9) (**LRR C**)
___ Histic Epipedon (A2)	___ Sandy Redox (S5)	___ Coast Prairie Redox (A16) (LRR F, G, H)
___ Black Histic (A3)	___ Stripped Matrix (S6)	___ Dark Surface (S7) (**LRR G**)
___ Hydrogen Sulfide (A4)	___ Loamy Mucky Mineral (F1)	___ High Plains Depressions (F16)
___ Stratified Layers (A5) (**LRR F**)	X Loamy Gleyed Matrix (F2)	(**LRR H outside MLRA 72 & 73**)
___ 1 cm Muck (A9) (**LRR F, G, H**)	___ Depleted Matrix (F3)	___ Reduced Vertic (F18)
___ Depleted Below Dark Surface (A11)	___ 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)	
___ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)	___ High Plains Depressions (F16)	[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.
___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)		

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes X No ___

Remarks:
There were small inclusions of mottles present in depths 4-10 in the matrix.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)	___ Salt Crusts (B11)	**Secondary Indicators (2 or more required)**
___ High Water Table (A2)	___ Aquatic Invertebrates (B13)	___ Surface Soil Cracks (B6)
___ Saturation (A3)	___ Hydrogen Sulfide Oder (C1)	___ Sparsely Vegetated Concave Surfaces (B8)
___ Water Marks (B1)	___ Dry-Season Water Table (C2)	X Drainage Patterns (B10)
___ Sediment Deposits (B2)	___ Presence of Reduced Iron (C4)	X Oxidized Rhizospheres on Living Roots (C3)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)	___ Crayfish Burrows (C8)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remark)	___ Saturation Visible on Aerial Imagery (C9)
___ Iron Deposits (B5)		___ Frost-Heave Hummocks (C11) (**LRR F**)
___ Inundation Visible on Aerial Imagery (B7)		X Geomorphic Position (D2)
___ Water Stained Leaves (B9)		___ FAC-Neutral Test (D5)
		___ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___	
Water Table Present?	Yes ___	No X	Depth (inches):	___	
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	___	**Wetland Hydrology Present?** Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/18/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W15

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 30, T6S, R1E

Landform (hillslope, terrace, etc.) Drainage | Local relief (concave, convex, none): Concave | Slope (%): 1

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: R2EM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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	
Hydric Soil Present?	Yes	X	No	
Wetland Hydrology Present	Yes	X	No	

Is the Sampled Area Within a Wetland Yes X No

Remarks:
R2 P12: Upstream
R2 P13: Downstream
Wetland is upstream and the channel width is about 8 feet wide.

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Spartina pectinata*	55	X	FACW
2. *Eleocharis palustris*	15		OBL
3. *Juncus balticus*	10		FACW
4. *Kochia scoparia*	10		FAC
5. *Bassia sieveriana*	10		FACU
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum | % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:	
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

X Dominance Test is > 50%
Prevalence Index is ≤ 3.0[1]
Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

Remarks:

SOIL Sampling Point W15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	2.5Y 4/1	90	7.5YR 4/6	10	C	RC, M	CL	
8-10	Gley1 3/N	70	7.5YR 5/8	30	C	M	SiC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)	___ Sandy Gleyed Matrix (S4)	___ 1 cm Muck (A9) (**LRR C**)
___ Histic Epipedon (A2)	___ Sandy Redox (S5)	___ Coast Prairie Redox (A16) (LRR F, G, H)
___ Black Histic (A3)	___ Stripped Matrix (S6)	___ Dark Surface (S7) (**LRR G**)
___ Hydrogen Sulfide (A4)	___ Loamy Mucky Mineral (F1)	___ High Plains Depressions (F16)
___ Stratified Layers (A5) (**LRR F**)	X Loamy Gleyed Matrix (F2)	(**LRR H outside MLRA 72 & 73**)
___ 1 cm Muck (A9) (**LRR F, G, H**)	X Depleted Matrix (F3)	___ Reduced Vertic (F18)
___ Depleted Below Dark Surface (A11)	___ 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)	
___ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)	___ High Plains Depressions (F16)	[3]Indicators of hydrophytic vegetation
___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)		and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

X Surface Water (A1)	___ Salt Crusts (B11)	**Secondary Indicators (2 or more required)**
___ High Water Table (A2)	___ Aquatic Invertebrates (B13)	___ Surface Soil Cracks (B6)
___ Saturation (A3)	___ Hydrogen Sulfide Oder (C1)	___ Sparsely Vegetated Concave Surfaces (B8)
___ Water Marks (B1)	___ Dry-Season Water Table (C2)	X Drainage Patterns (B10)
___ Sediment Deposits (B2)	___ Presence of Reduced Iron (C4)	X Oxidized Rhizospheres on Living Roots (C3)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)	___ Crayfish Burrows (C8)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remark)	___ Saturation Visible on Aerial Imagery (C9)
___ Iron Deposits (B5)		___ Frost-Heave Hummocks (C11) (**LRR F**)
___ Inundation Visible on Aerial Imagery (B7)		X Geomorphic Position (D2)
___ Water Stained Leaves (B9)		___ FAC-Neutral Test (D5)
		___ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches):	10	
Water Table Present?	Yes ___	No X	Depth (inches):	___	
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	___	**Wetland Hydrology Present?** Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/18/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W16

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 31, T6S, R1E

Landform (hillslope, terrace, etc.) Drainage | Local relief (concave, convex, none): Concave | Slope (%): 1

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: R2EM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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	
Hydric Soil Present?	Yes	X	No	
Wetland Hydrology Present	Yes	X	No	

Is the Sampled Area Within a Wetland Yes X No

Remarks:
R2 P18: Upstream
R2 P19: Downstream
Aquatic animals present

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Spartina pectinata*	30	X	FACW
2. *Cirsium arvense*	5		FACU
3. *Eleocharis palustris*	40	X	OBL
4. *Juncus balticus*	15		FACW
5. *Xanthium strumarium*	5		FAC
6. *Chenopodium album*	3		FAC
7. *Schoenoplectus pungens*	2		OBL
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species		x2=	
FAC species		x3=	
FACU species		x4=	
UPL species		x5=	
Column Totals:		(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

X Dominance Test is > 50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

Remarks:

SOIL Sampling Point W16

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	2.5Y 4/1	37	7.5YR 4/6	3	C	RC	C	
			Gley1 2.5/N	60	D	M	C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)	___ Sandy Gleyed Matrix (S4)	___ 1 cm Muck (A9) (**LRR C**)
___ Histic Epipedon (A2)	___ Sandy Redox (S5)	___ Coast Prairie Redox (A16) (LRR F, G, H)
___ Black Histic (A3)	___ Stripped 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 MLRA 72 & 73**)
___ 1 cm Muck (A9) (**LRR F, G, H**)	X Depleted Matrix (F3)	___ Reduced Vertic (F18)
___ Depleted Below Dark Surface (A11)	___ 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)	
___ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)	___ High Plains Depressions (F16)	[3]Indicators of hydrophytic vegetation
___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)		and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____ **Hydric Soils Present?** Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

X Surface Water (A1)	___ Salt Crusts (B11)	**Secondary Indicators (2 or more required)**
X High Water Table (A2)	___ Aquatic Invertebrates (B13)	___ Surface Soil Cracks (B6)
X Saturation (A3)	___ Hydrogen Sulfide Oder (C1)	___ Sparsely Vegetated Concave Surfaces (B8)
___ Water Marks (B1)	___ Dry-Season Water Table (C2)	X Drainage Patterns (B10)
___ Sediment Deposits (B2)	___ Presence of Reduced Iron (C4)	___ Oxidized Rhizospheres on Living Roots (C3)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)	___ Crayfish Burrows (C8)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remark)	___ Saturation Visible on Aerial Imagery (C9)
___ Iron Deposits (B5)		___ Frost-Heave Hummocks (C11) (**LRR F**)
___ Inundation Visible on Aerial Imagery (B7)		X Geomorphic Position (D2)
___ Water Stained Leaves (B9)		___ FAC-Neutral Test (D5)
		___ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches):	5	
Water Table Present?	Yes X	No ___	Depth (inches):	5	
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches):	5	**Wetland Hydrology Present?** Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/18/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W17

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 31, T6S, R1E

Landform (hillslope, terrace, etc.) Ditch around agricultural area | Local relief (concave, convex, none): convex | Slope (%): 2

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification:

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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	____	No	X
Hydric Soil Present?	Yes	____	No	X
Wetland Hydrology Present	Yes		No	X

Is the Sampled Area Within a Wetland Yes ____ No X

Remarks:
R2 P22: Upstream
R2 P23: Downstream
Previously mapped as PEMA

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			

Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			

Herb Stratum			
1. *Bromus inermis*	95	X	FACU
2. *Cirsium arvense*	2		FACU
3. *Chenopodium album*	3		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		

Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum | % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species		x2=	
FAC species	3	x3=	9
FACU species	97	x4=	388
UPL species		x5=	
Column Totals:	100 (A)		397 (B)
Prevalence Index = B/A =			3.97

Hydrophytic Vegetation Indicators

____ Dominance Test is > 50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL Sampling Point W17

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	2.5Y 2.5/1	100					C	
2-8	2.5Y 4/3	100					C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____ 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 (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)
- ____ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ 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 (F16)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) (**LRR C**)
- ____ Coast Prairie Redox (A16) (LRR F, G, H)
- ____ Dark Surface (S7) (**LRR G**)
- ____ High Plains Depressions (F16) (**LRR H outside 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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ 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 Leaves (B9)
- ____ Salt Crusts (B11)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Oder (C1)
- ____ Dry-Season Water Table (C2)
- ____ Presence of Reduced Iron (C4)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surfaces (B8)
- ____ Drainage Patterns (B10)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Frost-Heave Hummocks (C11) (**LRR F**)
- X Geomorphic Position (D2)
- ____ FAC-Neutral Test (D5)
- ____ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/18/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W18

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 31, T6S, R1E

Landform (hillslope, terrace, etc.) Drainage bank | Local relief (concave, convex, none): Concave | Slope (%): 5

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: R2EM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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		**Is the Sampled Area Within a Wetland** Yes X No
Hydric Soil Present?	Yes	X	No		
Wetland Hydrology Present	Yes	X	No		

Remarks:
R3 P1: Upstream
R3 P2: Downstream
Wpt 026 is similar to W18, R2 P24: Upstream
Width of wetland is about 17', width of channel is about 12'

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Spartina pectinata*	80	X	FACW
2. *Xanthium strumarium*	5		FAC
3. *Schoenoplectus pungens*	10		OBL
4. *Juncus balticus*	5		FACW
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust

Remarks:

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species		x2=	
FAC species		x3=	
FACU species		x4=	
UPL species		x5=	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

X Dominance Test is > 50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

SOIL Sampling Point W18

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	Gley1 4/5GY	97	2.5YR 7/8	3	C	M	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)	___ Sandy Gleyed Matrix (S4)	___ 1 cm Muck (A9) (**LRR C**)
___ Histic Epipedon (A2)	___ Sandy Redox (S5)	___ Coast Prairie Redox (A16) (LRR F, G, H)
___ Black Histic (A3)	___ Stripped Matrix (S6)	___ Dark Surface (S7) (**LRR G**)
___ Hydrogen Sulfide (A4)	___ Loamy Mucky Mineral (F1)	___ High Plains Depressions (F16)
___ Stratified Layers (A5) (**LRR F**)	X Loamy Gleyed Matrix (F2)	(**LRR H outside MLRA 72 & 73**)
___ 1 cm Muck (A9) (**LRR F, G, H**)	___ Depleted Matrix (F3)	___ Reduced Vertic (F18)
___ Depleted Below Dark Surface (A11)	___ 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)	
___ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)	___ High Plains Depressions (F16)	[3]Indicators of hydrophytic vegetation
___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)		and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)	___ Salt Crusts (B11)	**Secondary Indicators (2 or more required)**
X High Water Table (A2)	___ Aquatic Invertebrates (B13)	___ Surface Soil Cracks (B6)
___ Saturation (A3)	X Hydrogen Sulfide Oder (C1)	___ Sparsely Vegetated Concave Surfaces (B8)
___ Water Marks (B1)	___ Dry-Season Water Table (C2)	___ Drainage Patterns (B10)
___ Sediment Deposits (B2)	___ Presence of Reduced Iron (C4)	___ Oxidized Rhizospheres on Living Roots (C3)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)	___ Crayfish Burrows (C8)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remark)	Saturation Visible on Aerial Imagery (C9)
___ Iron Deposits (B5)		___ Frost-Heave Hummocks (C11) (**LRR F**)
___ Inundation Visible on Aerial Imagery (B7)		X Geomorphic Position (D2)
___ Water Stained Leaves (B9)		___ FAC-Neutral Test (D5)
		___ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___	
Water Table Present?	Yes X	No ___	Depth (inches):	8	**Wetland Hydrology Present?** Yes X No ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	___	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

The water table was present within 8" of the surface.

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/18/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W19

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 31, T6S, R1E

Landform (hillslope, terrace, etc.) Low area | Local relief (concave, convex, none): Concave | Slope (%):

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification:

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ Naturally problematic? (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		No	X
Hydric Soil Present?	Yes	X	No	
Wetland Hydrology Present	Yes		No	X

Is the Sampled Area Within a Wetland Yes ___ No X

Remarks:
Low vegetation cover, Normal circumstances present within an active prairie dog community. Previously NWI mapped as PEMF.
R3 P3: Northwest
R3 P4: East

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Chenopodium berlandieri*	99	X	FAC
2. *Bassia sieveriana*	1		FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 65 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species		x2=	
FAC species	99	x3=	297
FACU species	1	x4=	4
UPL species		x5=	
Column Totals:	100 (A)		301 (B)

Prevalence Index = B/A = 3.01

Hydrophytic Vegetation Indicators

___ Dominance Test is > 50%
___ Prevalence Index is ≤ 3.0[1]
___ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes ___ No X

Remarks:

SOIL Sampling Point W19

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 4/1	95	7.5YR 5/8	5	C	M	SiCL	
2-4	10YR 4/1	100					SiCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ 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 (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside 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.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soils Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ 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 Leaves (B9)
- ___ Salt Crusts (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Oder (C1)
- ___ Dry-Season Water Table (C2)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surfaces (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Frost-Heave Hummocks (C11) (**LRR F**)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___	
Water Table Present?	Yes ___	No X	Depth (inches):	___	
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	___	**Wetland Hydrology Present?** Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/18/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W20

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 9, T7S, R1E

Landform (hillslope, terrace, etc.) Drainage | Local relief (concave, convex, none): Concave | Slope (%): 0

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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	
Hydric Soil Present?	Yes		No	X
Wetland Hydrology Present	Yes	X	No	

Is the Sampled Area Within a Wetland Yes X No

Remarks:
R2 P12: Upstream
R2 P13: Downstream
Wetland is upstream and the channel width is about 8 feet wide.

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Schoenoplectus pungens*	90	X	OBL
2. *Cirsium arvense*	5		FACU
3. *Bassia sieveriana*	5		FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:	
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

X Dominance Test is > 50%
Prevalence Index is ≤ 3.0[1]
Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

Remarks:

SOIL Sampling Point W20

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/1	98	5YR 5/8	2	C	M	C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ 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 (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ 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 (F16)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside 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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes ___ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ 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 Leaves (B9)
- ___ Salt Crusts (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Oder (C1)
- ___ Dry-Season Water Table (C2)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surfaces (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Frost-Heave Hummocks (C11) (**LRR F**)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches):	5	
Water Table Present?	Yes ___	No X	Depth (inches):	___	
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	___	

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/18/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W21

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 9, T7S, R1E

Landform (hillslope, terrace, etc.) Drainage | Local relief (concave, convex, none): Concave | Slope (%): 2

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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	
Hydric Soil Present?	Yes	X	No	
Wetland Hydrology Present	Yes	X	No	

Is the Sampled Area Within a Wetland Yes X No

Remarks:
R3 P10: Upstream
R3 P11: Downstream
R3 P12: Bridge
Channel crosses the boundary and extends to the road

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Typha latifolia*	55	X	OBL
2. *Asclepias speciosa*	10		FAC
3. *Glycyrrhiza lepidota*	15		FACU
4. *Spartina pectinata*	5		FACW
5. *Helianthus annuus*	5		FACU
6. *Melilotus sp.*	5		FACU
7. *Schoenoplectus pungens*	5		OBL
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum | % Cover of Biotic Crust

Remarks:

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:	
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

X Dominance Test is > 50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

SOIL Sampling Point W21

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	5YR 3/4	100					SCL	
3-5	10YR 2/2	50	5YR 4/6	50	C	M	SCL	water filled the hole

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____ 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 (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)
- ____ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ____ High Plains Depressions (F16)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) (**LRR C**)
- ____ Coast Prairie Redox (A16) (LRR F, G, H)
- ____ Dark Surface (S7) (**LRR G**)
- ____ High Plains Depressions (F16) (**LRR H outside 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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- X Surface Water (A1)
- ____ High Water Table (A2)
- ____ 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 Leaves (B9)
- ____ Salt Crusts (B11)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Oder (C1)
- ____ Dry-Season Water Table (C2)
- ____ Presence of Reduced Iron (C4)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surfaces (B8)
- ____ Drainage Patterns (B10)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Frost-Heave Hummocks (C11) (**LRR F**)
- ____ Geomorphic Position (D2)
- ____ FAC-Neutral Test (D5)
- ____ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches):	0	
Water Table Present?	Yes X	No ____	Depth (inches):	____	
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches):	____	

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/18/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W22

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 9, T7S, R1E

Landform (hillslope, terrace, etc.) Drainage | Local relief (concave, convex, none): Concave | Slope (%): 0

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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		**Is the Sampled Area Within a Wetland** Yes X No
Hydric Soil Present?	Yes		No	X	
Wetland Hydrology Present	Yes	X	No		

Remarks:
R3 P13: Upstream
R3 P14: Downstream

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Spartina pectinata*	81	X	FACW
2. *Cirsium arvense*	19		FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 15 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species	81	x2=	162
FAC species		x3=	
FACU species	19	x4=	76
UPL species		x5=	
Column Totals:	100 (A)		238 (B)

Prevalence Index = B/A = 2.38

Hydrophytic Vegetation Indicators

X Dominance Test is > 50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

Remarks:

SOIL Sampling Point W22

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 4/6	100					SC	
1-4	2.5YR 3/2	100					SC	Hit rock at 4 inches

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- _____ 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 (A11)
- _____ Thick Dark Surface (A12)
- _____ Sandy Mucky Mineral (S1)
- _____ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)
- _____ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- _____ Sandy Gleyed Matrix (S4)
- _____ Sandy Redox (S5)
- _____ Stripped Matrix (S6)
- _____ 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 (F16)

Indicators for Problematic Hydric Soils[3]:

- _____ 1 cm Muck (A9) (**LRR C**)
- _____ Coast Prairie Redox (A16) (LRR F, G, H)
- _____ Dark Surface (S7) (**LRR G**)
- _____ High Plains Depressions (F16) (**LRR H outside 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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- _____ Surface Water (A1)
- _____ High Water Table (A2)
- _____ 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 Leaves (B9)
- _____ Salt Crusts (B11)
- _____ Aquatic Invertebrates (B13)
- _____ Hydrogen Sulfide Oder (C1)
- _____ Dry-Season Water Table (C2)
- _____ Presence of Reduced Iron (C4)
- _____ Thin Muck Surface (C7)
- _____ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- _____ Surface Soil Cracks (B6)
- _____ Sparsely Vegetated Concave Surfaces (B8)
- X Drainage Patterns (B10)
- _____ Oxidized Rhizospheres on Living Roots (C3)
- _____ Crayfish Burrows (C8)
- _____ Saturation Visible on Aerial Imagery (C9)
- _____ Frost-Heave Hummocks (C11) (**LRR F**)
- X Geomorphic Position (D2)
- _____ FAC-Neutral Test (D5)
- _____ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

Dry throughout the area and there was encroachment of upland species.

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/18/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W23

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 10, T7S, R1E

Landform (hillslope, terrace, etc.) Drainage | Local relief (concave, convex, none): Concave | Slope (%): 1

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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	
Hydric Soil Present?	Yes	X	No	
Wetland Hydrology Present	Yes		No	X

Is the Sampled Area Within a Wetland Yes X No

Remarks:
R3 P17: Upstream
R3 P18: Downstream
Possible low spot that collects water, dying cattails present.

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			

Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			

Herb Stratum			
1. *Spartina pectinata*	9		FACW
2. *Cirsium arvense*	20	X	FACU
3. *Bassia sieveriana*	10		FACU
4. *Typha latifolia*	60	X	OBL
5. *Chenopodium album*	1		FAC
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		

Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	60	x1=	60
FACW species	9	x2=	18
FAC species	1	x3=	3
FACU species	30	x4=	120
UPL species		x5=	
Column Totals:	100	(A)	201 (B)

Prevalence Index = B/A = 2.01

Hydrophytic Vegetation Indicators

____ Dominance Test is > 50%
X Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

Remarks:

SOIL Sampling Point W23

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/1	100					SiC	
2-6	5YR 4/6	95	7.5YR 5/8	5	C	RC	C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)	___ Sandy Gleyed Matrix (S4)	___ 1 cm Muck (A9) (**LRR C**)
___ Histic Epipedon (A2)	___ Sandy Redox (S5)	___ Coast Prairie Redox (A16) (LRR F, G, H)
___ Black Histic (A3)	___ Stripped 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 MLRA 72 & 73**)
___ 1 cm Muck (A9) (**LRR F, G, H**)	___ Depleted Matrix (F3)	___ Reduced Vertic (F18)
___ Depleted Below Dark Surface (A11)	___ Redox Dark Surface (F6)	___ Red Parent Material (TF2)
___ Thick Dark Surface (A12)	___ Depleted Dark Surface (F7)	___ Other (Explain in Remarks)
___ Sandy Mucky Mineral (S1)	X Redox Depressions (F8)	
___ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)	___ High Plains Depressions (F16)	[3]Indicators of hydrophytic vegetation
___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)		and wetland hydrology must be present.

Indicators for Problematic Hydric Soils[3]:

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes X No ___

Remarks:
Orange coloration due to parent material

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)	___ Salt Crusts (B11)	___ Surface Soil Cracks (B6)
___ High Water Table (A2)	___ Aquatic Invertebrates (B13)	___ Sparsely Vegetated Concave Surfaces (B8)
___ Saturation (A3)	___ Hydrogen Sulfide Oder (C1)	___ Drainage Patterns (B10)
___ Water Marks (B1)	___ Dry-Season Water Table (C2)	___ Oxidized Rhizospheres on Living Roots (C3)
___ Sediment Deposits (B2)	___ Presence of Reduced Iron (C4)	___ Crayfish Burrows (C8)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)	___ Saturation Visible on Aerial Imagery (C9)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remark)	___ Frost-Heave Hummocks (C11) (**LRR F**)
___ Iron Deposits (B5)		X Geomorphic Position (D2)
___ Inundation Visible on Aerial Imagery (B7)		___ FAC-Neutral Test (D5)
___ Water Stained Leaves (B9)		___ Local Soil Survey Data (D8)

Secondary Indicators (2 or more required)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___	
Water Table Present?	Yes ___	No X	Depth (inches):	___	
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	___	**Wetland Hydrology Present?** Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/19/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W25

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 34, T6S, R1E

Landform (hillslope, terrace, etc.) Drainage | Local relief (concave, convex, none): Concave | Slope (%): 0

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification:

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ Naturally problematic? (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		No	X
Hydric Soil Present?	Yes		No	X
Wetland Hydrology Present	Yes		No	X

Is the Sampled Area Within a Wetland Yes ___ No X

Remarks:
R4 P1: Upstream
R4 P2: Downstream

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	100	X	FAC
2.			
3.			
4.			
Total Cover:	100		

Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			

Herb Stratum			
1. *Elymus smithii*	95	X	FACU
2. *Chenopodium album*	5		FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		

Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:		
OBL species		x1=		
FACW species		x2=		
FAC species	105	x3=	315	
FACU species	95	x4=	380	
UPL species		x5=		
Column Totals:	200	(A)	695	(B)

Prevalence Index = B/A = 3.48

Hydrophytic Vegetation Indicators

___ Dominance Test is > 50%
___ Prevalence Index is ≤ 3.0[1]
___ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes ___ No X

Remarks:
Upland species in drainage and banks, there were two living *Populus deltoids* present.

SOIL Sampling Point W25

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	5YR 2.5/1	60					SiCL	
Parent material	5YR 4/4	40						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____ 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 (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)
- ____ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ 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 (F16)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) (**LRR C**)
- ____ Coast Prairie Redox (A16) (LRR F, G, H)
- ____ Dark Surface (S7) (**LRR G**)
- ____ High Plains Depressions (F16) (**LRR H outside MLRA 72 & 73**)
- ____ Reduced Vertic (F18)
- X Red Parent Material (TF2)
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ____

Depth (inches): ____

Hydric Soils Present? Yes ____ No X

Remarks:
Orange coloration due to parent material

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ 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 Leaves (B9)
- ____ Salt Crusts (B11)
- ____ *Aquatic Invertebrates* (B13)
- ____ Hydrogen Sulfide Oder (C1)
- ____ Dry-Season Water Table (C2)
- ____ *Presence of Reduced Iron* (C4)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surfaces (B8)
- ____ *Drainage Patterns* (B10)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Frost-Heave Hummocks (C11) (**LRR F**)
- X Geomorphic Position (D2)
- ____ FAC-Neutral Test (D5)
- ____ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____
Water Table Present? Yes ____ No X Depth (inches): ____
Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/19/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W26

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 34, T6S, R1E

Landform (hillslope, terrace, etc.) Drainage | Local relief (concave, convex, none): Concave | Slope (%): 0

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification:

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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		No	X	**Is the Sampled Area Within a Wetland** Yes ____ No X
Hydric Soil Present?	Yes	X	No		
Wetland Hydrology Present	Yes	X	No		

Remarks:
R4 P3: Upstream
R4 P4: Downstream
Upland vegetation has moved down the banks and in the area of the drainage on either side.

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Elymus smithii*	30	X	FACU
2. *Elymus canadensis*	25	X	FACU
3. *Thlaspi arvense*	5		FACU
4. *Bassia sieveriana*	10		FACU
5. *Phalaris arundinacea*	15		FACW
6. *Chenopodium album*	5		FAC
7. *Xanthium strumarium*	5		FAC
8. *Helianthus annuus*	5		FACU
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species	15	x2=	30
FAC species	10	x3=	30
FACU species	75	x4=	300
UPL species		x5=	
Column Totals:	100 (A)		360 (B)

Prevalence Index = B/A = 3.60

Hydrophytic Vegetation Indicators

____ Dominance Test is > 50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL Sampling Point W26

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	2.5YR 4/8	100					C	
1-7	7.5YR 4/2	100					C	
7-9	Gley2 2.5/10B	100					C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)	___ Sandy Gleyed Matrix (S4)	___ 1 cm Muck (A9) (**LRR C**)
___ Histic Epipedon (A2)	___ Sandy Redox (S5)	___ Coast Prairie Redox (A16) (LRR F, G, H)
___ Black Histic (A3)	___ Stripped Matrix (S6)	___ Dark Surface (S7) (**LRR G**)
___ Hydrogen Sulfide (A4)	___ Loamy Mucky Mineral (F1)	___ High Plains Depressions (F16)
___ Stratified Layers (A5) (**LRR F**)	X Loamy Gleyed Matrix (F2)	(**LRR H outside MLRA 72 & 73**)
___ 1 cm Muck (A9) (**LRR F, G, H**)	___ Depleted Matrix (F3)	___ Reduced Vertic (F18)
___ Depleted Below Dark Surface (A11)	___ Redox Dark Surface (F6)	X Red Parent Material (TF2)
___ Thick Dark Surface (A12)	___ Depleted Dark Surface (F7)	___ Other (Explain in Remarks)
___ Sandy Mucky Mineral (S1)	___ Redox Depressions (F8)	
___ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)	___ High Plains Depressions (F16)	[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.
___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)		

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes X No ___

Remarks:
Orange coloration due to parent material

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)	___ Salt Crusts (B11)	X Surface Soil Cracks (B6)
___ High Water Table (A2)	___ Aquatic Invertebrates (B13)	___ Sparsely Vegetated Concave Surfaces (B8)
___ Saturation (A3)	___ Hydrogen Sulfide Oder (C1)	___ Drainage Patterns (B10)
___ Water Marks (B1)	___ Dry-Season Water Table (C2)	___ Oxidized Rhizospheres on Living Roots (C3)
___ Sediment Deposits (B2)	___ Presence of Reduced Iron (C4)	___ Crayfish Burrows (C8)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)	Saturation Visible on Aerial Imagery (C9)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remark)	Frost-Heave Hummocks (C11) (**LRR F**)
___ Iron Deposits (B5)		X Geomorphic Position (D2)
___ Inundation Visible on Aerial Imagery (B7)		___ FAC-Neutral Test (D5)
___ Water Stained Leaves (B9)		___ Local Soil Survey Data (D8)

Secondary Indicators (2 or more required)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): ___		
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___	**Wetland Hydrology Present?**	Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/19/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W27

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 34, T6S, R1E

Landform (hillslope, terrace, etc.) Drainage | Local relief (concave, convex, none): Concave | Slope (%): 1

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification:

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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		No	X
Hydric Soil Present?	Yes		No	X
Wetland Hydrology Present	Yes	X	No	

Is the Sampled Area Within a Wetland Yes ____ No X

Remarks:
R4 P1: Upstream
R4 P2: Downstream

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Elymus smithii*	40	X	FACU
2. *Elymus canadensis*	30	X	FACU
3. *Chenopodium album*	10		FAC
4. *Xanthium strumarium*	10		FAC
5. *Helianthus annuus*	10		FACU
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 98 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species		x2=	
FAC species	20	x3=	60
FACU species	80	x4=	320
UPL species		x5=	
Column Totals:	100 (A)		380 (B)

Prevalence Index = B/A = 3.80

Hydrophytic Vegetation Indicators

____ Dominance Test is > 50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:
The vegetation is only on the banks and not in the drainage; the percent bare ground in channel is 98%.

SOIL Sampling Point W27

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	2.5Y 5/3	100					C	
0.75	2.5YR 4/8	100					C	
1-8	2.5Y 5/3	100					C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ 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 (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ 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 (F16)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- X Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soils Present? Yes ___ No X

Remarks:
One inch to the red layer (red layer is about 2 cm thick). The black layer is organic.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ 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 Leaves (B9)
- ___ Salt Crusts (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Oder (C1)
- ___ Dry-Season Water Table (C2)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- X Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surfaces (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Frost-Heave Hummocks (C11) (**LRR F**)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:
Soil is moist but not saturated.

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock City/County: Custer County Sampling Date: 9/19/07

Applicant/Owner: Knight Piesold, Powertech State: South Dakota Sampling Point: W28

Investigator(s): C. Robinson and J. Eberly Section, Township, Range: Section 34, T6S, R1E

Landform (hillslope, terrace, etc.) Drainage Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRP): Black Hills MLRA62 Lat: _____ Long: _____ Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: _____ NWI Classification: _____

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation ____ , Soil ____ , or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____ , Soil ____ , or Hydrology ____ Naturally problematic? (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	_____	No	X	**Is the Sampled Area Within a Wetland** Yes _____ No X
Hydric Soil Present?	Yes	_____	No	X	
Wetland Hydrology Present	Yes	_____	No	X	

Remarks:
R4 P13: Upstream
R4 P14: Downstream

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	100	X	FAC
2.			
3.			
4.			
Total Cover:	100		
Sapling/Shrub Stratum			
1. *Symphoricarpos albus*	100	X	FACU-
2.			
3.			
4.			
5.			
Total Cover:	100		
Herb Stratum			
1. *Elymus smithii*	35	X	FACU
2. *Bassia sieveriana*	20	X	FACU
3. *Calamovilfa longifolia*	12		NI
4. *Descurainia pinnata*	1		NI
5. *Thlaspi arvense*	3		FACU
6. *Chenopodium album*	17		FAC
7. *Asclepias speciosa*	2		FAC
8. *Elymus cinerius*	15		NI
9. *Sisymbrium altissimum*	2		UPL
10. *Camelina microcarpa*	1		NI
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	_____	x1=	_____
FACW species	_____	x2=	_____
FAC species	119	x3=	357
FACU species	158	x4=	632
UPL species	2	x5=	10
Column Totals:	279 (A)		999 (B)

Prevalence Index = B/A = 3.58

Hydrophytic Vegetation Indicators

_____ Dominance Test is > 50%
_____ Prevalence Index is ≤ 3.0[1]
_____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
_____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

POWERTECH (USA) INC.

SOIL Sampling Point W28

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	5YR 4/6	100					SC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ 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 (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ 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 (F16)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- X Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soils Present? Yes ___ No X

Remarks:
Orange coloration due to parent material

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ 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 Leaves (B9)
- ___ Salt Crusts (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Oder (C1)
- ___ Dry-Season Water Table (C2)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surfaces (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Frost-Heave Hummocks (C11) (**LRR F**)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___	
Water Table Present?	Yes ___	No X	Depth (inches):	___	
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	___	**Wetland Hydrology Present?** Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/19/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W29

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 3, T7S, R1E

Landform (hillslope, terrace, etc.) Drainage | Local relief (concave, convex, none): Concave | Slope (%): 2

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification:

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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	____	No	X
Hydric Soil Present?	Yes	____	No	X
Wetland Hydrology Present	Yes		No	X

Is the Sampled Area Within a Wetland Yes ____ No X

Remarks:
R4 P17: Upstream
R4 P18: Downstream
Area is similar through the drainage; the upland species are dominant in the drainage. The Drainage is about 3' across on average.

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	100	X	FAC
2.			
3.			
4.			
Total Cover:	100		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Elymus smithii*	10		FACU
2. *Bassia sieveriana*	5		FACU
3. *Elymus canadensis*	40	X	FACU
4. *Helianthus annuus*	5		FACU
5. *Nassella viridula*	10		NI
6. *Chenopodium album*	3		FACU
7. *Asclepias speciosa*	2		FAC
8. *Bromus inermis*	20	X	FACU
9. *Sisymbrium altissimum*	5		UPL
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 50 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.33 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species		x2=	
FAC species	102	x3=	306
FACU species	83	x4=	332
UPL species	5	x5=	25
Column Totals:	190 (A)		663 (B)

Prevalence Index = B/A = 3.49

Hydrophytic Vegetation Indicators

____ Dominance Test is > 50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL Sampling Point W29

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	5YR 4/6	100					C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____ 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 (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)
- ____ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ 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 (F16)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) (**LRR C**)
- ____ Coast Prairie Redox (A16) (LRR F, G, H)
- ____ Dark Surface (S7) (**LRR G**)
- ____ High Plains Depressions (F16) (**LRR H outside MLRA 72 & 73**)
- ____ Reduced Vertic (F18)
- X Red Parent Material (TF2)
- ____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ____

Depth (inches): ____

Hydric Soils Present? Yes ____ No X

Remarks:
Hard to dig soil.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ 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 Leaves (B9)
- ____ Salt Crusts (B11)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Oder (C1)
- ____ Dry-Season Water Table (C2)
- ____ Presence of Reduced Iron (C4)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surfaces (B8)
- ____ Drainage Patterns (B10)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Frost-Heave Hummocks (C11) (**LRR F**)
- X Geomorphic Position (D2)
- ____ FAC-Neutral Test (D5)
- ____ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):	____	
Water Table Present?	Yes ____	No X	Depth (inches):	____	
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):	____	**Wetland Hydrology Present?** Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/19/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W30

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 10, T7S, R1E

Landform (hillslope, terrace, etc.) Depression | Local relief (concave, convex, none): Concave | Slope (%): 1

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification:

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ Naturally problematic? (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		No	X	**Is the Sampled Area Within a Wetland** Yes ___ No X
Hydric Soil Present?	Yes	X	No		
Wetland Hydrology Present	Yes		No	X	

Remarks:
R4 P19: East
R4 P20: West
Waypoints 46-49 mark the boundary

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Elymus smithii*	85	X	FACU
2. *Carex filifolia*	15		UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 30 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species		x2=	
FAC species		x3=	
FACU species	85	x4=	340
UPL species	15	x5=	75
Column Totals:	100 (A)		415 (B)

Prevalence Index = B/A = 4.15

Hydrophytic Vegetation Indicators

___ Dominance Test is > 50%
___ Prevalence Index is ≤ 3.0[1]
___ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes ___ No X

Remarks:

POWERTECH (USA) INC.

SOIL Sampling Point W30

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	7.5YR 4/1	70	7.5YR 4/6	30	C	M	SiC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)	___ Sandy Gleyed Matrix (S4)	___ 1 cm Muck (A9) (**LRR C**)
___ Histic Epipedon (A2)	___ Sandy Redox (S5)	___ Coast Prairie Redox (A16) (LRR F, G, H)
___ Black Histic (A3)	___ Stripped 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 MLRA 72 & 73**)
___ 1 cm Muck (A9) (**LRR F, G, H**)	X Depleted Matrix (F3)	___ Reduced Vertic (F18)
___ Depleted Below Dark Surface (A11)	___ Redox Dark Surface (F6)	___ Red Parent Material (TF2)
___ Thick Dark Surface (A12)	___ Depleted Dark Surface (F7)	___ Other (Explain in Remarks)
___ Sandy Mucky Mineral (S1)	X Redox Depressions (F8)	
___ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)	___ High Plains Depressions (F16)	[3]Indicators of hydrophytic vegetation
___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)		and wetland hydrology must be present.

Indicators for Problematic Hydric Soils[3]:

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes X No _____

Remarks:
Orange coloration due to parent material

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)	___ Salt Crusts (B11)	**Secondary Indicators (2 or more required)**
___ High Water Table (A2)	___ Aquatic Invertebrates (B13)	___ Surface Soil Cracks (B6)
___ Saturation (A3)	___ Hydrogen Sulfide Oder (C1)	___ Sparsely Vegetated Concave Surfaces (B8)
___ Water Marks (B1)	___ Dry-Season Water Table (C2)	___ Drainage Patterns (B10)
___ Sediment Deposits (B2)	___ Presence of Reduced Iron (C4)	___ Oxidized Rhizospheres on Living Roots (C3)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)	___ Crayfish Burrows (C8)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remark)	___ Saturation Visible on Aerial Imagery (C9)
___ Iron Deposits (B5)		___ Frost-Heave Hummocks (C11) (**LRR F**)
___ Inundation Visible on Aerial Imagery (B7)		___ Geomorphic Position (D2)
___ Water Stained Leaves (B9)		___ FAC-Neutral Test (D5)
		___ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___	
Water Table Present?	Yes ___	No X	Depth (inches):	___	**Wetland Hydrology Present?** Yes ___ No X
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	___	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/19/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W31

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 10, T7S, R1E

Landform (hillslope, terrace, etc.) Depression | Local relief (concave, convex, none): Concave | Slope (%): 1

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: PUB

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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	
Hydric Soil Present?	Yes		No	X
Wetland Hydrology Present	Yes	X	No	

Is the Sampled Area Within a Wetland Yes X No

Remarks:
R4 P21: Northeast
R4 P22: East- southeast

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Distichlis stricta*	35	X	FACW
2. *Sporobolus airoides*	20	X	FAC
3. *Salsola tragus*	45	X	FACU-
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 70 % Cover of Biotic Crust

Remarks:

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.67 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species	35	x2=	70
FAC species	20	x3=	60
FACU species	45	x4=	180
UPL species		x5=	
Column Totals:	100 (A)		310 (B)

Prevalence Index = B/A = 3.10

Hydrophytic Vegetation Indicators

X Dominance Test is > 50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

SOIL Sampling Point W31

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-0.5	White salt crust							
0.5-14	10YR 4/3	100					C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- _____ 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 (A11)
- _____ Thick Dark Surface (A12)
- _____ Sandy Mucky Mineral (S1)
- _____ 2.5 cm Mucky Peat or Peat (S2) **(LFF G, H)**
- _____ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- _____ Sandy Gleyed Matrix (S4)
- _____ Sandy Redox (S5)
- _____ Stripped Matrix (S6)
- _____ 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 (F16)

Indicators for Problematic Hydric Soils[3]:

- _____ 1 cm Muck (A9) **(LRR C)**
- _____ Coast Prairie Redox (A16) (LRR F, G, H)
- _____ Dark Surface (S7) **(LRR G)**
- _____ High Plains Depressions (F16) **(LRR H outside 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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- _____ Surface Water (A1)
- _____ High Water Table (A2)
- _____ 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 Leaves (B9)
- X Salt Crusts (B11)
- _____ Aquatic Invertebrates (B13)
- _____ Hydrogen Sulfide Oder (C1)
- _____ Dry-Season Water Table (C2)
- _____ Presence of Reduced Iron (C4)
- _____ Thin Muck Surface (C7)
- _____ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- _____ Surface Soil Cracks (B6)
- _____ Sparsely Vegetated Concave Surfaces (B8)
- _____ Drainage Patterns (B10)
- _____ Oxidized Rhizospheres on Living Roots (C3)
- _____ Crayfish Burrows (C8)
- _____ Saturation Visible on Aerial Imagery (C9)
- _____ Frost-Heave Hummocks (C11) **(LRR F)**
- _____ Geomorphic Position (D2)
- _____ FAC-Neutral Test (D5)
- _____ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/19/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W32

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 10, T7S R1E

Landform (hillslope, terrace, etc.) Depression | Local relief (concave, convex, none): Concave | Slope (%): 0

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: PUS

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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		**Is the Sampled Area Within a Wetland** Yes X No
Hydric Soil Present?	Yes	X	No		
Wetland Hydrology Present	Yes		No	X	

Remarks:
R4 P24: Of the previously mapped PEM wetland
R4 P25: from the berm

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Echinochloa muricata*	100	X	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum | % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:	
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

X Dominance Test is > 50%

____ Prevalence Index is ≤ 3.0[1]

____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

Remarks:

SOIL Sampling Point W32

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	5YR 4/1	50	7.5YR 4/6	50	C	M	C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)	___ Sandy Gleyed Matrix (S4)	___ 1 cm Muck (A9) **(LRR C)**
___ Histic Epipedon (A2)	___ Sandy Redox (S5)	___ Coast Prairie Redox (A16) (LRR F, G, H)
___ Black Histic (A3)	___ Stripped 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 MLRA 72 & 73)**
___ 1 cm Muck (A9) **(LRR F, G, H)**	X Depleted Matrix (F3)	___ Reduced Vertic (F18)
___ Depleted Below Dark Surface (A11)	___ Redox Dark Surface (F6)	___ Red Parent Material (TF2)
___ Thick Dark Surface (A12)	___ Depleted Dark Surface (F7)	___ Other (Explain in Remarks)
___ Sandy Mucky Mineral (S1)	X Redox Depressions (F8)	
___ 2.5 cm Mucky Peat or Peat (S2) **(LFF G, H)**	___ High Plains Depressions (F16)	[3]Indicators of hydrophytic vegetation
___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**		and wetland hydrology must be present.

Indicators for Problematic Hydric Soils[3]:

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)	___ Salt Crusts (B11)
___ High Water Table (A2)	___ Aquatic Invertebrates (B13)
___ Saturation (A3)	___ Hydrogen Sulfide Oder (C1)
___ Water Marks (B1)	___ Dry-Season Water Table (C2)
___ Sediment Deposits (B2)	___ Presence of Reduced Iron (C4)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remark)
___ Iron Deposits (B5)	
___ Inundation Visible on Aerial Imagery (B7)	
___ Water Stained Leaves (B9)	

Secondary Indicators (2 or more required)

X Surface Soil Cracks (B6)	
___ Sparsely Vegetated Concave Surfaces (B8)	
___ Drainage Patterns (B10)	
___ Oxidized Rhizospheres on Living Roots (C3)	
___ Crayfish Burrows (C8)	
Saturation Visible on Aerial Imagery (C9)	
___ Frost-Heave Hummocks (C11) **(LRR F)**	
___ Geomorphic Position (D2)	
___ FAC-Neutral Test (D5)	
___ Local Soil Survey Data (D8)	

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): ___		
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___	**Wetland Hydrology Present?**	Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/19/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W33

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 14, T7S, R1E

Landform (hillslope, terrace, etc.) Pond | Local relief (concave, convex, none): Concave | Slope (%): 0

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____ , Soil ____ , or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____ , Soil ____ , or Hydrology ____ Naturally problematic? (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		**Is the Sampled Area Within a Wetland** Yes X No
Hydric Soil Present?	Yes	X	No		
Wetland Hydrology Present	Yes	X	No		

Remarks:
R4 P1: Upstream
R4 P2: Downstream

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Juncus balticus*	20	X	FACW
2. *Distichlis stricta*	50	X	FACW
3. *Schoenoplectus tabernaemontani*	30	X	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:	
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

X Dominance Test is > 50%

____ Prevalence Index is ≤ 3.0[1]

____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

Remarks:
Schoenoplectus tabernaemontani dominant on the fringe of the pond.

SOIL Sampling Point W33

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/6	90	Gley1 2.5/N	10	D	M	C	
4-8	Gley1 3/N	100					C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

	Histosol (A1)		Sandy Gleyed Matrix (S4)		1 cm Muck (A9) (**LRR C**)
	Histic Epipedon (A2)		Sandy Redox (S5)		Coast Prairie Redox (A16) (LRR F, G, H)
	Black Histic (A3)		Stripped Matrix (S6)		Dark Surface (S7) (**LRR G**)
	Hydrogen Sulfide (A4)		Loamy Mucky Mineral (F1)		High Plains Depressions (F16)
	Stratified Layers (A5) (**LRR F**)	X	Loamy Gleyed Matrix (F2)		(**LRR H outside MLRA 72 & 73**)
	1 cm Muck (A9) (**LRR F, G, H**)		Depleted Matrix (F3)		Reduced Vertic (F18)
	Depleted Below Dark Surface (A11)		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)		
	2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)		High Plains Depressions (F16)		[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.
	5 cm Mucky Peat or Peat (S3) (**LRR F**)				

Indicators for Problematic Hydric Soils[3]:

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soils Present? Yes X No

Remarks:
Orange coloration due to parent material

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

X	Surface Water (A1)		Salt Crusts (B11)
X	High Water Table (A2)		Aquatic Invertebrates (B13)
X	Saturation (A3)		Hydrogen Sulfide Oder (C1)
	Water Marks (B1)		Dry-Season Water Table (C2)
	Sediment Deposits (B2)		Presence of Reduced Iron (C4)
	Drift Deposits (B3)		Thin Muck Surface (C7)
	Algal Mat or Crust (B4)		Other (Explain in Remark)
	Iron Deposits (B5)		
	Inundation Visible on Aerial Imagery (B7)		
	Water Stained Leaves (B9)		

Secondary Indicators (2 or more required)

	Surface Soil Cracks (B6)
	Sparsely Vegetated Concave Surfaces (B8)
	Drainage Patterns (B10)
	Oxidized Rhizospheres on Living Roots (C3)
	Crayfish Burrows (C8)
	Saturation Visible on Aerial Imagery (C9)
	Frost-Heave Hummocks (C11) (**LRR F**)
	Geomorphic Position (D2)
	FAC-Neutral Test (D5)
	Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes X	No	Depth (inches):	
Water Table Present?	Yes X	No	Depth (inches):	2
Saturation Present? (includes capillary fringe)	Yes X	No	Depth (inches):	4

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/19/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W34

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 14, T7S, R1E

Landform (hillslope, terrace, etc.) Drainage | Local relief (concave, convex, none): Concave | Slope (%): 0

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification:

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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		No	X	**Is the Sampled Area Within a Wetland** Yes ____ No X
Hydric Soil Present?	Yes	X	No		
Wetland Hydrology Present	Yes		No	X	

Remarks:
R5 P9: Upstream
R5 P10: Downstream
Waypoint 58 indicates the end of surface water (R5 P8)

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Hordeum jubatum*	15	X	FACW
2. *Xanthium strumarium*	10		FAC
3. *Chenopodium album*	10		FACU
4. *Grindelia squarrosa*	15	X	UPL
5. *Cirsium arvense*	10		FACU
6. *Polygonum aviculare*	35	X	FACU
7. *Elymus smithii*	5		FACU
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.33 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species	15	x2=	30
FAC species	10	x3=	30
FACU species	60	x4=	240
UPL species	15	x5=	75
Column Totals:	100	(A)	375 (B)

Prevalence Index = B/A = 3.75

Hydrophytic Vegetation Indicators

____ Dominance Test is > 50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL Sampling Point W34

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	Gley1 2.5/N	95	2.5YR 4/8	5	C	M, RC	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___	Histosol (A1)	___	Sandy Gleyed Matrix (S4)	___	1 cm Muck (A9) (**LRR C**)
___	Histic Epipedon (A2)	___	Sandy Redox (S5)	___	Coast Prairie Redox (A16) (LRR F, G, H)
___	Black Histic (A3)	___	Stripped Matrix (S6)	___	Dark Surface (S7) (**LRR G**)
___	Hydrogen Sulfide (A4)	___	Loamy Mucky Mineral (F1)	___	High Plains Depressions (F16)
___	Stratified Layers (A5) (**LRR F**)	X	Loamy Gleyed Matrix (F2)		(**LRR H outside MLRA 72 & 73**)
___	1 cm Muck (A9) (**LRR F, G, H**)	___	Depleted Matrix (F3)	___	Reduced Vertic (F18)
___	Depleted Below Dark Surface (A11)	___	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)		
___	2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)	___	High Plains Depressions (F16)		[3]Indicators of hydrophytic vegetation
___	5 cm Mucky Peat or Peat (S3) (**LRR F**)				and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___	Surface Water (A1)	___	Salt Crusts (B11)	___	Surface Soil Cracks (B6)
___	High Water Table (A2)	___	Aquatic Invertebrates (B13)	___	Sparsely Vegetated Concave Surfaces (B8)
___	Saturation (A3)	___	Hydrogen Sulfide Oder (C1)	___	Drainage Patterns (B10)
___	Water Marks (B1)	___	Dry-Season Water Table (C2)	___	Oxidized Rhizospheres on Living Roots (C3)
___	Sediment Deposits (B2)	___	Presence of Reduced Iron (C4)	___	Crayfish Burrows (C8)
___	Drift Deposits (B3)	___	Thin Muck Surface (C7)		Saturation Visible on Aerial Imagery (C9)
___	Algal Mat or Crust (B4)	___	Other (Explain in Remark)	___	Frost-Heave Hummocks (C11) (**LRR F**)
___	Iron Deposits (B5)			X	Geomorphic Position (D2)
___	Inundation Visible on Aerial Imagery (B7)			___	FAC-Neutral Test (D5)
___	Water Stained Leaves (B9)			___	Local Soil Survey Data (D8)

Secondary Indicators (2 or more required)

Field Observations:

Surface Water Present?	Yes ___	No	X	Depth (inches):	___	
Water Table Present?	Yes ___	No	X	Depth (inches):	___	
Saturation Present? (includes capillary fringe)	Yes ___	No	X	Depth (inches):	___	**Wetland Hydrology Present?** Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/19/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W35

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 14, T7S, R1E

Landform (hillslope, terrace, etc.) Depression | Local relief (concave, convex, none): Concave | Slope (%): 1

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: PUB

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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	
Hydric Soil Present?	Yes		No	X
Wetland Hydrology Present	Yes	X	No	

Is the Sampled Area Within a Wetland Yes X No

Remarks:
R5 P11: Facing east
R5 P12: Facing south
Possible stock dam

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Distichlis stricta*	80	X	FACW
2. *Melilotus sp.*	20		FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 80 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species	80	x2=	160
FAC species		x3=	
FACU species	20	x4=	80
UPL species		x5=	
Column Totals:	100 (A)		240 (B)

Prevalence Index = B/A = 2.40

Hydrophytic Vegetation Indicators

____ Dominance Test is > 50%
X Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

Remarks:

SOIL Sampling Point W35

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	7.5YR 2.5/1	80	2.5YR 4/8	20	C	M	C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____ 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 (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)
- ____ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ 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 (F16)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) (**LRR C**)
- ____ Coast Prairie Redox (A16) (LRR F, G, H)
- ____ Dark Surface (S7) (**LRR G**)
- ____ High Plains Depressions (F16) (**LRR H outside 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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ 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 Leaves (B9)
- ____ Salt Crusts (B11)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Oder (C1)
- ____ Dry-Season Water Table (C2)
- ____ Presence of Reduced Iron (C4)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- X Surface Soil Cracks (B6)
- X Sparsely Vegetated Concave Surfaces (B8)
- ____ Drainage Patterns (B10)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Frost-Heave Hummocks (C11) (**LRR F**)
- ____ Geomorphic Position (D2)
- ____ FAC-Neutral Test (D5)
- ____ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):	____	
Water Table Present?	Yes ____	No X	Depth (inches):	____	
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):	____	

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:
Soil is moist but not saturated.

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/19/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W36

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 10, T7S, R1E

Landform (hillslope, terrace, etc.) Outfall | Local relief (concave, convex, none): Concave | Slope (%): 0

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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	
Hydric Soil Present?	Yes	X	No	
Wetland Hydrology Present	Yes	X	No	

Is the Sampled Area Within a Wetland Yes X No

Remarks:
R5 P20: Downstream
R5 P21: Upstream to stock tank
Stock tank overflow
-waypoint 60- end of N
- waypoint 68, R5 P18: Upstream, R5 P19: Downstream
- waypoint 67 end of W, further SW there is *Hordeum jubatum was* dominant in channel and water disappears.

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Hordeum jubatum*	20	X	FACW
2. *Juncus balticus*	65	X	FACW
3. *Melilotus alba*	10		FACU-
4. *Rumex occidentalis*	5		OBL
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 2 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:	
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

X Dominance Test is > 50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

Remarks:
Overflow area from stockpond.

SOIL *Sampling Point W36*

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 4/1	70	10YR 5/8	30	C	M	C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ 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 (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside 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.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soils Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ 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 Leaves (B9)
- ___ Salt Crusts (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Oder (C1)
- ___ Dry-Season Water Table (C2)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surfaces (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Frost-Heave Hummocks (C11) (**LRR F**)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes	X	No	___	Depth (inches):	4
Water Table Present?	Yes	___	No	X	Depth (inches):	___
Saturation Present? (includes capillary fringe)	Yes	___	No	X	Depth (inches):	___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:
Soil is moist, but not saturated.

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/20/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W37

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 34, T6S R1E

Landform (hillslope, terrace, etc.) Outfall | Local relief (concave, convex, none): Concave | Slope (%): 0

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: Open water

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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		No	X	**Is the Sampled Area Within a Wetland** Yes ____ No X
Hydric Soil Present?	Yes		No	X	
Wetland Hydrology Present	Yes	X	No		

Remarks:
R6 P6 - P10 Panoramic east to west
Approximately 30 feet across
Previously NWI mapped as PUBGx

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Typha latifolia*	25	X	OBL
2. *Cirsium arvense*	75	X	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum | % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	25	x1=	25
FACW species		x2=	
FAC species		x3=	
FACU species	75	x4=	300
UPL species		x5=	
Column Totals:	100 (A)		325 (B)

Prevalence Index = B/A = 3.25

Hydrophytic Vegetation Indicators

____ Dominance Test is > 50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:
Cattails dominate on water edge. *Cirsium arvense* dominate from water edge to 3 feet out. Rabbitbrush on upland bank.

POWERTECH (USA) INC.

SOIL Sampling Point W37

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	5Y 5/3	100					SCL	Fibrous root channel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____ 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 (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)
- ____ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ 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 (F16)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) (**LRR C**)
- ____ Coast Prairie Redox (A16) (LRR F, G, H)
- ____ Dark Surface (S7) (**LRR G**)
- ____ High Plains Depressions (F16) (**LRR H outside 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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes ____ No X

Remarks:
Soils likely hydric where cattails are- across unavailable due to steep drop in to pit
Soils are moist not saturated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- X Surface Water (A1)
- ____ High Water Table (A2)
- ____ 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 Leaves (B9)
- ____ Salt Crusts (B11)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Oder (C1)
- ____ Dry-Season Water Table (C2)
- ____ Presence of Reduced Iron (C4)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surfaces (B8)
- ____ Drainage Patterns (B10)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Frost-Heave Hummocks (C11) (**LRR F**)
- ____ Geomorphic Position (D2)
- ____ FAC-Neutral Test (D5)
- ____ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes	X	No		Depth (inches): ____
Water Table Present?	Yes	____	No	X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes	____	No	X	Depth (inches): ____

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:
Soil is moist, but not saturated.
Duck swimming in pond

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/20/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W38

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 2, T7S, R1E

Landform (hillslope, terrace, etc.) Depression | Local relief (concave, convex, none): Concave | Slope (%): 0

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: PUS

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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		**Is the Sampled Area Within a Wetland** Yes X No
Hydric Soil Present?	Yes	X	No		
Wetland Hydrology Present	Yes	X	No		

Remarks:
R6 P13: East
R6 P14: North
300-500 feet across and 80 or 81 feet long

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populous deltoides*	100	X	FAC
2.			
3.			
4.			
Total Cover:	100		

Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			

Herb Stratum			
1. *Juncus balticus*	50	X	FACW
2. *Distichlis stricta*	50	X	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		

Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum | % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:	
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

X Dominance Test is > 50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

Remarks:

POWERTECH (USA) INC.

SOIL Sampling Point W38

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5YR 3/2	60	7.5YR 5/8	40	C	M	C	Lots of cow prints in area

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ 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 (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ___ High Plains Depressions (F16)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside 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.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soils Present? Yes X No ___

Remarks:
Soils likely hydric where cattails are- across unavailable due to steep drop in to pit
Soils are moist not saturated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ 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 Leaves (B9)
- ___ Salt Crusts (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Oder (C1)
- ___ Dry-Season Water Table (C2)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- X Surface Soil Cracks (B6)
- X Sparsely Vegetated Concave Surfaces (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Frost-Heave Hummocks (C11) (**LRR F**)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water Table Present? Yes ___ No X Depth (inches): ___
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/20/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W39

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range:

Landform (hillslope, terrace, etc.) Depression w/ manmade berm | Local relief (concave, convex, none): Concave | Slope (%): 0

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: PUS

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ Naturally problematic? (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	
Hydric Soil Present?	Yes	X	No	
Wetland Hydrology Present	Yes	X	No	

Is the Sampled Area Within a Wetland Yes X No

Remarks:
R6 P16: of depression
R6 P17: of drainage to East
Waypoint 83, *Hordeum jubatum* depression with like soils as W39. R6 P15
Down the drainage there is HORJUB on banks and in bottom with same soil and hydrology

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Hordeum jubatum*	95	X	FACW
2. *Melilotus officinalis*	5		FACU-
3. *Descurainia pinnata*	5		NI
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum | % Cover of Biotic Crust

Remarks:

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:	
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

X Dominance Test is > 50%
___ Prevalence Index is ≤ 3.0[1]
___ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

SOIL Sampling Point W39

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	5YR 4/1	55	2.5YR 4/6	45	C	M, RC	C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)	___ Sandy Gleyed Matrix (S4)	___ 1 cm Muck (A9) (**LRR C**)
___ Histic Epipedon (A2)	___ Sandy Redox (S5)	___ Coast Prairie Redox (A16) (LRR F, G, H)
___ Black Histic (A3)	___ Stripped 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 MLRA 72 & 73**)
___ 1 cm Muck (A9) (**LRR F, G, H**)	X Depleted Matrix (F3)	___ Reduced Vertic (F18)
___ Depleted Below Dark Surface (A11)	___ Redox Dark Surface (F6)	___ Red Parent Material (TF2)
___ Thick Dark Surface (A12)	___ Depleted Dark Surface (F7)	___ Other (Explain in Remarks)
___ Sandy Mucky Mineral (S1)	X Redox Depressions (F8)	
___ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)	___ High Plains Depressions (F16)	[3]Indicators of hydrophytic vegetation
___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)		and wetland hydrology must be present.

Indicators for Problematic Hydric Soils[3]:

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

X Surface Water (A1)	___ Salt Crusts (B11)
___ High Water Table (A2)	___ Aquatic Invertebrates (B13)
___ Saturation (A3)	___ Hydrogen Sulfide Oder (C1)
___ Water Marks (B1)	___ Dry-Season Water Table (C2)
___ Sediment Deposits (B2)	___ Presence of Reduced Iron (C4)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remark)
___ Iron Deposits (B5)	
___ Inundation Visible on Aerial Imagery (B7)	
___ Water Stained Leaves (B9)	

Secondary Indicators (2 or more required)

___ Surface Soil Cracks (B6)
X Sparsely Vegetated Concave Surfaces (B8)
___ Drainage Patterns (B10)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Crayfish Burrows (C8)
Saturation Visible on Aerial Imagery (C9)
___ Frost-Heave Hummocks (C11) (**LRR F**)
X Geomorphic Position (D2)
___ FAC-Neutral Test (D5)
___ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/20/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W40

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 1, T7S, R1E

Landform (hillslope, terrace, etc.) Pond | Local relief (concave, convex, none): Concave | Slope (%): 1

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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		**Is the Sampled Area Within a Wetland** Yes X No
Hydric Soil Present?	Yes	X	No		
Wetland Hydrology Present	Yes	X	No		

Remarks:
R6 P18: Pond

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Spartina pectinata*	100	X	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum | % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:	
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

X Dominance Test is > 50%

____ Prevalence Index is ≤ 3.0[1]

____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

Remarks:

SOIL Sampling Point W40

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-11	2.5Y 5/2	65	Gley1 5/N	15	D	RC	SiC	
			10YR 5/8	20	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ 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 (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ___ High Plains Depressions (F16)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside 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.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soils Present? Yes X No ___

Remarks:
Soil is moist but not saturated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ 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 Leaves (B9)
- ___ Salt Crusts (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Oder (C1)
- ___ Dry-Season Water Table (C2)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surfaces (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- ___ Frost-Heave Hummocks (C11) (**LRR F**)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches):	3	
Water Table Present?	Yes ___	No X	Depth (inches):	___	
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	___	

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/20/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W41

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 1, T7S, R1E

Landform (hillslope, terrace, etc.) Mine pit | Local relief (concave, convex, none): Concave | Slope (%): 1

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: PUB

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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	
Hydric Soil Present?	Yes	X	No	
Wetland Hydrology Present	Yes		No	X

Is the Sampled Area Within a Wetland Yes X No

Remarks:
R6 P19: Wetland
R6 P20: General area
Wetland has about a 20' circumference. This area may be a problematic wetland as some of the vegetation was dead.

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Typha latifolia*	20	X	OBL
2. *Grindelia squarrosa*	15		UPL
3. *Symphyotrichum ericoides*	15		FACU
4. *Distichlis stricta*	50	X	FACW
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:	
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

X Dominance Test is > 50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

Remarks:
Grindelia squarrosa, Symphyotrichum ericoides, and rabbit brush are encroaching into the depression.

POWERTECH (USA) INC.

SOIL Sampling Point W41

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	Gley1 5/10Y	95	10YR 6/8	5	C	M	C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ 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 (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- X Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside 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.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soils Present? Yes X No ___

Remarks:
Soil is moist but not saturated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ 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 Leaves (B9)
- ___ Salt Crusts (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Oder (C1)
- ___ Dry-Season Water Table (C2)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surfaces (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Frost-Heave Hummocks (C11) (**LRR F**)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): ___		
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___	**Wetland Hydrology Present?**	Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

Other pits within the area are filled with water.

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/20/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W42

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 1, T7S, R1E

Landform (hillslope, terrace, etc.) Mine Pit | Local relief (concave, convex, none): Concave | Slope (%): 1

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: PUB

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____ , Soil ____ , or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____ , Soil ____ , or Hydrology ____ Naturally problematic? (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	
Hydric Soil Present?	Yes		No	X
Wetland Hydrology Present	Yes	X	No	

Is the Sampled Area Within a Wetland Yes X No

Remarks:
R6 P22- 24: Panoramic west to east.

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Spartina pectinata*	40	X	FACW
2. *Distichlis stricta*	60	X	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:	
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

X Dominance Test is > 50%

Prevalence Index is ≤ 3.0[1]

Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

Remarks:
Little bluestem dominates the upper banks.

SOIL Sampling Point W42

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 5/1	45	Gley1 4/N	5	D		SC	
			10YR 5/6	50	C			

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____ 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 (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)
- ____ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ 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 (F16)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) (**LRR C**)
- ____ Coast Prairie Redox (A16) (LRR F, G, H)
- ____ Dark Surface (S7) (**LRR G**)
- ____ High Plains Depressions (F16) (**LRR H outside 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.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes ____ No X

Remarks:
Soil is moist but not saturated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- X Surface Water (A1)
- ____ High Water Table (A2)
- ____ 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 Leaves (B9)
- ____ Salt Crusts (B11)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Oder (C1)
- ____ Dry-Season Water Table (C2)
- ____ Presence of Reduced Iron (C4)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surfaces (B8)
- ____ Drainage Patterns (B10)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- ____ Frost-Heave Hummocks (C11) (**LRR F**)
- ____ Geomorphic Position (D2)
- ____ FAC-Neutral Test (D5)
- ____ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches):	6	
Water Table Present?	Yes ____	No X	Depth (inches):	____	
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):	____	

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/20/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W43

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 36, T6S, R1E (Outside of Project Boundary)

Landform (hillslope, terrace, etc.) Depression, ponded area due to berm | Local relief (concave, convex, none): Concave | Slope (%): 0

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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	
Hydric Soil Present?	Yes		No	X
Wetland Hydrology Present	Yes	X	No	

Is the Sampled Area Within a Wetland Yes X No

Remarks:
R7 P15: West R7 P17: East of pond
R7 P16: Middle
Cattle grazed here. On the other side of the berm there are *Pinus ponderosa.*

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Juncus balticus*	60	X	FACW
2. *Typha latifolia*	40	X	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 90 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:	
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

X Dominance Test is > 50%
Prevalence Index is ≤ 3.0[1]
Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

Remarks:
Moss is present. *Distichlis stricta* present in the middle of the pond.

SOIL Sampling Point W43

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 5/3	75	Gley1 3/N	20	D	M	C	
			5YR 5/8	5	C	M	C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ____ 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 (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)
- ____ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ 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 (F16)

Indicators for Problematic Hydric Soils[3]:

- ____ 1 cm Muck (A9) (**LRR C**)
- ____ Coast Prairie Redox (A16) (LRR F, G, H)
- ____ Dark Surface (S7) (**LRR G**)
- ____ High Plains Depressions (F16) (**LRR H outside 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.

Restrictive Layer (if present):

Type: ____

Depth (inches): ____

Hydric Soils Present? Yes ____ No X

Remarks:
Soil is moist but not saturated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- X Surface Water (A1)
- X High Water Table (A2)
- 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 Leaves (B9)
- ____ Salt Crusts (B11)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Oder (C1)
- ____ Dry-Season Water Table (C2)
- ____ Presence of Reduced Iron (C4)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surfaces (B8)
- ____ Drainage Patterns (B10)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Frost-Heave Hummocks (C11) (**LRR F**)
- ____ Geomorphic Position (D2)
- ____ FAC-Neutral Test (D5)
- ____ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes	X	No	____	Depth (inches): 4
Water Table Present?	Yes	X	No	____	Depth (inches): 3
Saturation Present? (includes capillary fringe)	Yes	X	No	____	Depth (inches): 3

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock City/County: Custer County Sampling Date: 9/20/07

Applicant/Owner: Knight Piesold, Powertech State: South Dakota Sampling Point: W44

Investigator(s): C. Robinson and J. Eberly Section, Township, Range: Section 2, T7S, R1E

Landform (hillslope, terrace, etc.) Depression Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRP): Black Hills MLRA62 Lat: _____ Long: _____ Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: _____ NWI Classification: PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation ____ , Soil ____ , or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____ , Soil ____ , or Hydrology ____ Naturally problematic? (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	
Hydric Soil Present?	Yes	X	No	
Wetland Hydrology Present	Yes	X	No	

Is the Sampled Area Within a Wetland Yes X No _____

Remarks:
R7 P24: Northwest
R8 P1: North
R8 P2: East

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Juncus balticus*	85	X	FACW
2. *Distichlis stricta*	15		FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum 40 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1=	
FACW species		x2=	
FAC species		x3=	
FACU species		x4=	
UPL species		x5=	
Column Totals:		(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators

X Dominance Test is > 50%

____ Prevalence Index is ≤ 3.0[1]

____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL Sampling Point W44

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 5/2	68	7.5YR 5/8	30	C	M	SiC	
			Gley1 3/N	2	D	M	SiC	
6-8	10YR 3/1	98	7.5YR 5/8	2	C	M	SiC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ 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 (A11)
- ___ Thick Dark Surface (A12)
- ___ *Sandy Mucky Mineral* (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LFF G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ *Sandy Redox* (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X *Redox Depressions* (F8)
- ___ High Plains Depressions (F16)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ *Coast Prairie Redox* (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside 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.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soils Present? Yes X No ___

Remarks:
Soil is moist, concentrations sparse in the 6-8 inches layer.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ 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 Leaves (B9)
- ___ Salt Crusts (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Oder (C1)
- ___ Dry-Season Water Table (C2)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surfaces (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Frost-Heave Hummocks (C11) (**LRR F**)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes	X	No	___	Depth (inches):	3
Water Table Present?	Yes	___	No	X	Depth (inches):	___
Saturation Present? (includes capillary fringe)	Yes	___	No	X	Depth (inches):	___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

POWERTECH (USA) INC.

WETLAND DETERMINATION DATA FORM-Great Plains Region (DRAFT)

Project/Site: Dewey Burdock | City/County: Custer County | Sampling Date: 9/20/07

Applicant/Owner: Knight Piesold, Powertech | State: South Dakota | Sampling Point: W45

Investigator(s): C. Robinson and J. Eberly | Section, Township, Range: Section 1, T7S, R1E

Landform (hillslope, terrace, etc.) Depression | Local relief (concave, convex, none): Concave | Slope (%): 1

Subregion (LRP): Black Hills MLRA62 | Lat: | Long: | Datum: NAD 1983, UTM Zone 13

Soil Map Unit Name: | NWI Classification: PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ Naturally problematic? (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	
Hydric Soil Present?	Yes	X	No	
Wetland Hydrology Present	Yes	X	No	

Is the Sampled Area Within a Wetland Yes X No

Remarks:
R8 P4: Upstream
R8 P5: Downstream
Stockwater pond (20' wide by 50' long)

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Mimulus guttatus*	70	X	OBL
2. *Distichlis stricta*	30	X	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
3.			
Total Cover:			

% Bare Ground in Herb Stratum % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:	
OBL species	x1=	
FACW species	x2=	
FAC species	x3=	
FACU species	x4=	
UPL species	x5=	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

X Dominance Test is > 50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (Providing supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

[1]Indicators of hydric soils and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No

Remarks:

SOIL Sampling Point W45

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	Gley1 5/10Y	60	7.5Y 5/6	35	C	M, RC	C	
			Gley1 4/N	5	D	M		
8-10	2.5Y 5/4	90	5YR 5/6	10	C	M	SC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ 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 (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LFF G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- X Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ___ High Plains Depressions (F16)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRR H outside 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.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soils Present? Yes X No ___

Remarks:
Soil is moist but not saturated.
Black parent material in 8-10 inch layer.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ 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 Leaves (B9)
- ___ Salt Crusts (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Oder (C1)
- ___ Dry-Season Water Table (C2)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remark)

Secondary Indicators (2 or more required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surfaces (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Frost-Heave Hummocks (C11) **(LRR F)**
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes	X	No	___	Depth (inches): 3-5
Water Table Present?	Yes	___	No	X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes	___	No	X	Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspection), if available:

Remarks:

APPENDIX 3.5-H

APPROVED JURISDICTIONAL DETERMINATIONS

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
SOUTH DAKOTA REGULATORY OFFICE
28563 POWERHOUSE ROAD, ROOM 118
PIERRE SD 57501-6174

REPLY TO
ATTENTION OF :

1/19/09

January 14, 2009

South Dakota Regulatory Office
28563 Powerhouse Road, Room 118
Pierre, South Dakota 57501

Powertech (USA) Inc.
ATTN: Mr. Richard Blubaugh
5575 DTC Parkway, Suite 140
Greenwood Village, Colorado 80111

Dear Mr. Blubaugh:

Reference is made to Powertech's November 18, 2008, request for approved jurisdictional determinations (JDs) for sites 1 through 17, located within proposed disturbance areas of the Dewey-Burdock In Situ Uranium Project. The project is located in portions of southern Custer County and northern Fall River Counties, South Dakota.

We have completed Approved JDs, for the requested sites, as well as sites 18 through 20. The Approved JDs (Enclosed) are valid for 5 years from the date of this letter. If you are not in agreement with the JDs, you may request an administrative appeal under Corps of Engineers regulations found at 33 C.F.R. 331. Enclosed you will also find a Notification of Administrative Appeal Options and Process and Request for Appeal form (RFA). Should you decide to submit an RFA form, it must be received by the Corps of Engineers Northwestern Division Office within 60 days from the date of this correspondence (March 15, 2009). If you request to appeal this determination you must submit a completed RFA form to the Northwest Division Office at the following address:

US Army Corps of Engineers
Northwestern Division
Attn: David Gesl
Regulatory Program Manager
PO Box 2870
Portland, OR 97208-2870
(503) 808-3888

It is not necessary to submit a RFA if you do not object to the JD.

Should your proposed project require work in any of the jurisdictional waterbodies identified in the JDs, prior Department of the Army (DA) authorization may be required and you should contact this office for a permit determination. In addition, should your project plans change or should the project require work in any other waters of the United

States, including wetlands, not previously identified in your August 21, 2008, JD request, you should notify this office and seek additional jurisdictional and permit determinations prior to the commencement of work in these waterbodies.

You can obtain additional information about the Regulatory Program and download forms from our website: https://www.nwo.usace.army.mil/html/od-rsd/frame.html .

If you have any questions concerning this determination, please feel free to contact this office at the above Regulatory Office address, or telephone Mr. Matthew Mikulecky at (605) 224-8531 and reference action ID NWO-2008-2206.

Sincerely,

Steven E. Naylor
Regulatory Program Manager,
South Dakota

Enclosures

USACOE Approved Jurisdictional Determination of Wetlands at Dewey-Burdock, Action IS: NOW-2008-2206[1]

Site #	Latitude: Northing (GPS)	Longitude: Westing (GPS)	Description	COE Determination
1	43.50106	104.02757	Upland Swale	Nonjurisdictional
2	43.49590	104.02211	Upland Swale	Nonjurisdictional
3	43.48897	104.02025	Ephemeral Tributary to Beaver Creek	Jurisdictional WOUS
4	43.48654	104.01299	Upland Swale	Nonjurisdictional
5	43.48819	104.01023	Upland Swale	Nonjurisdictional
6	43.46919	103.98704	Upland Swale	Nonjurisdictional
7	43.46591	103.98474	Ephemeral Tributary to Pass Creek	Jurisdictional WOUS
8	43.45801	103.97643	Upland Swale	Nonjurisdictional
9	43.45117	103.98366	Upland Swale	Nonjurisdictional
10	43.47719	103.99297	Pass Creek (NonRPW)	Jurisdictional WOUS
11	43.48869	103.96516	Upland Swale	Nonjurisdictional
12	43.48794	103.96532	Upland Swale	Nonjurisdictional
13	43.45098	103.96838	Upland Swale	Nonjurisdictional
14	43.45080	103.96185	Upland Vegetated Drainage lacking a downstream connection to WOUS	Nonjurisdictional
15	43.47863	103.95662	Upland Swale	Nonjurisdictional
16	43.46359	103.94818	Upland Hillside Gully	Nonjurisdictional
17	NA	NA	Artificial Pond created by diking uplands	Nonjurisdictional
18	NA	NA	Beaver Creek (Perennial RPW)	Jurisdictional WOUS
19	NA	NA	Isolated Wetland	Nonjurisdictional
20	NA	NA	Isolated Wetland	Nonjurisdictional

[1]Completion date for Approved Jurisdictional Determination (JD): January 13, 2009
District Office, File Name, and Number: Omaha – Powertech (USA) Inc.- NOW-2008-2206-3-PIE

APPENDIX 3.5-I

LAB RESULTS – ENERGY LABORATORIES, INC.

ENERGY LABORATORIES, INC. • 2393 Salt Creek Highway (82601) • P.O. Box 3258 • Casper, WY 82602
Toll Free 888.235.0515 • 307.235.0515 • Fax 307.234.1639 • casper@energylab.com • www.energylab.com

ANALYTICAL SUMMARY REPORT

June 19, 2008

Fish identifications corrected as marked.
A. Wones - ICF Jones & Stokes

Jones and Stokes
1901 Energy Ct Ste 115
Gillette, WY 82718

Workorder No.: C08040910

Project Name: Dewey-Burdock 010996.07

Energy Laboratories, Inc. received the following 15 samples from Jones and Stokes on 4/18/2008 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test	
C08040910-001	BVC01-Green Sunfish	04/16/08 00:00	04/18/08	Fish	Uranium, Total Digestion For RadioChemistry Lead 210 Polonium 210 Radium 226 Thorium, Isotopic Services Provided by Lab	
C08040910-002	BVC01-Plains Killfish	04/16/08 00:00	04/18/08	Fish	Same As Above	
C08040910-003	BVC01-Longnose Dace	04/16/08 00:00	04/18/08	Fish	Same As Above	
C08040910-004	BVC01-~~Emerald Shiner~~	04/16/08 00:00	04/18/08	Fish	Same As Above	Fathead Minnow
C08040910-005	BVC04-Plains Killfish	04/16/08 00:00	04/18/08	Fish	Same As Above	
C08040910-006	BVC04-~~Quill Back~~	04/16/08 00:00	04/18/08	Fish	Same As Above	River Carpsucker
C08040910-007	BVC04-Green Sunfish	04/16/08 00:00	04/18/08	Fish	Same As Above	
C08040910-008	BVC04-~~Emerald Shiner~~	04/16/08 00:00	04/18/08	Fish	Same As Above	Fathead Minnow
C08040910-009	BVC04-Channel Catfish	04/16/08 00:00	04/18/08	Fish	Same As Above	
C08040910-010	CHR05-~~Quill Back~~	04/15/08 00:00	04/18/08	Fish	Same As Above	River Carpsucker
C08040910-011	CHR05-Green Sunfish	04/15/08 00:00	04/18/08	Fish	Same As Above	
C08040910-012	CHR05-~~Mottled Sucker~~	04/15/08 00:00	04/18/08	Fish	Same As Ab	Shorthead Redhorse Sucker
C08040910-013	CHR05-~~Fine Scale Dace~~	04/15/08 00:00	04/18/08	Fish	Same As Above	Creek Chub
C08040910-014	CHR05-Plains Killfish	04/15/08 00:00	04/18/08	Fish	Same As Above	
C08040910-015	CHR05-~~Shiner~~	04/15/08 00:00	04/18/08	Fish	Same As Above	Sand Shiner

As appropriate, any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these tests results, please call.

Report Approved By: STEVE CARLSTON

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey-Burdock 010996.07
Lab ID: C08040910-001
Client Sample ID: BVC01-Green Sunfish

Report Date: 06/19/08
Collection Date: 04/16/08
DateReceived: 04/18/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	ND	mg/kg		0.02		SW6020	05/11/08 01:09 / ts
Uranium, Activity	ND	uCi/kg	D	2.0E-05		SW6020	05/11/08 01:09 / ts
RADIONUCLIDES - TOTAL							
Polonium 210	0.0E+00	uCi/kg	U	5.0E-05		RMO-3008	06/02/08 11:15 / plj
Polonium 210 precision (±)	6.0E-05	uCi/kg				RMO-3008	06/02/08 11:15 / plj
Lead 210	0.0E+00	uCi/kg	U	5.0E-05		E909.0M	05/21/08 09:00 / dm
Lead 210 precision (±)	2.0E-04	uCi/kg				E909.0M	05/21/08 09:00 / dm
Thorium 230	0.0E+00	uCi/kg	U	1.0E-05		E907.0	05/09/08 14:00 / dmf
Thorium 230 precision (±)	2.0E-05	uCi/kg				E907.0	05/09/08 14:00 / dmf
Radium 226	3.0E-04	uCi/kg				E903.0	05/15/08 15:31 / trs
Radium 226 precision (±)	9.0E-05	uCi/kg				E903.0	05/15/08 15:31 / trs
Radium 226 MDC	1.0E-04	uCi/kg				E903.0	05/15/08 15:31 / trs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
U - Not detected at minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey-Burdock 010996.07
Lab ID: C08040910-002
Client Sample ID: BVC01-Plains Killfish

Report Date: 06/19/08
Collection Date: 04/16/08
DateReceived: 04/18/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	ND	mg/kg	D	0.3		SW6020	05/11/08 01:18 / ts
Uranium, Activity	ND	uCi/kg	D	2.0E-04		SW6020	05/11/08 01:18 / ts
RADIONUCLIDES - TOTAL							
Polonium 210	0.0E+00	uCi/kg	UD	5.0E-04		RMO-3008	06/02/08 11:15 / plj
Polonium 210 precision (±)	8.0E-04	uCi/kg				RMO-3008	06/02/08 11:15 / plj
Lead 210	2.0E-02	uCi/kg	D	5.0E-04		E909.0M	06/09/08 08:30 / dm
Lead 210 precision (±)	2.0E-02	uCi/kg				E909.0M	06/09/08 08:30 / dm
Thorium 230	2.0E-04	uCi/kg	D	1.0E-04		E907.0	05/09/08 14:00 / dmf
Thorium 230 precision (±)	3.0E-04	uCi/kg				E907.0	05/09/08 14:00 / dmf
Radium 226	-4.0E-04	uCi/kg	U			E903.0	05/16/08 15:11 / trs
Radium 226 precision (±)	4.0E-04	uCi/kg				E903.0	05/16/08 15:11 / trs
Radium 226 MDC	9.0E-04	uCi/kg				E903.0	05/16/08 15:11 / trs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
U - Not detected at minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey-Burdock 010996.07
Lab ID: C08040910-003
Client Sample ID: BVC01-Longnose Dace

Report Date: 06/19/08
Collection Date: 04/16/08
DateReceived: 04/18/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	ND	mg/kg	D	0.9		SW6020	05/11/08 01:22 / ts
Uranium, Activity	ND	uCi/kg	D	6.0E-04		SW6020	05/11/08 01:22 / ts
RADIONUCLIDES - TOTAL							
Polonium 210	2.0E-03	uCi/kg	D	1.0E-03		RMO-3008	06/02/08 11:15 / plj
Polonium 210 precision (±)	3.0E-03	uCi/kg				RMO-3008	06/02/08 11:15 / plj
Lead 210	0.0E+00	uCi/kg	UD	1.0E-03		E909.0M	05/21/08 09:00 / dm
Lead 210 precision (±)	7.0E-03	uCi/kg				E909.0M	05/21/08 09:00 / dm
Thorium 230	1.0E-03	uCi/kg	D	3.0E-04		E907.0	05/09/08 14:00 / dmf
Thorium 230 precision (±)	1.0E-03	uCi/kg				E907.0	05/09/08 14:00 / dmf
Radium 226	-2.0E-03	uCi/kg	U			E903.0	05/16/08 15:11 / trs
Radium 226 precision (±)	1.0E-03	uCi/kg				E903.0	05/16/08 15:11 / trs
Radium 226 MDC	3.0E-03	uCi/kg				E903.0	05/16/08 15:11 / trs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
U - Not detected at minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey-Burdock 010996.07
Lab ID: C08040910-004
Client Sample ID: BVC01-~~Emerald Shiner~~ Fathead Minnow

Report Date: 06/19/08
Collection Date: 04/16/08
DateReceived: 04/18/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	ND	mg/kg	D	0.1		SW6020	05/11/08 01:42 / ts
Uranium, Activity	ND	uCi/kg	D	1.0E-04		SW6020	05/11/08 01:42 / ts
RADIONUCLIDES - TOTAL							
Polonium 210	4.0E-04	uCi/kg	D	2.0E-04		RMO-3008	06/02/08 11:15 / plj
Polonium 210 precision (±)	5.0E-04	uCi/kg				RMO-3008	06/02/08 11:15 / plj
Lead 210	0.0E+00	uCi/kg	UD	2.0E-04		E909.0M	05/21/08 09:00 / dm
Lead 210 precision (±)	1.0E-03	uCi/kg				E909.0M	05/21/08 09:00 / dm
Thorium 230	0.0E+00	uCi/kg	UD	5.0E-05		E907.0	05/09/08 14:00 / dmf
Thorium 230 precision (±)	7.0E-05	uCi/kg				E907.0	05/09/08 14:00 / dmf
Radium 226	-1.0E-04	uCi/kg	U			E903.0	05/16/08 15:11 / trs
Radium 226 precision (±)	2.0E-04	uCi/kg				E903.0	05/16/08 15:11 / trs
Radium 226 MDC	5.0E-04	uCi/kg				E903.0	05/16/08 15:11 / trs

Report Definitions:
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QCL - Quality control limit.
MDC - Minimum detectable concentration
U - Not detected at minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey-Burdock 010996.07
Lab ID: C08040910-005
Client Sample ID: BVC04-Plains Killfish

Report Date: 06/19/08
Collection Date: 04/16/08
DateReceived: 04/18/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	ND	mg/kg	D	0.8		SW6020	05/11/08 01:46 / ts
Uranium, Activity	ND	uCi/kg	D	5.0E-04		SW6020	05/11/08 01:46 / ts
RADIONUCLIDES - TOTAL							
Polonium 210	0.0E+00	uCi/kg	U	1.0E-03		RMO-3008	06/02/08 11:15 / plj
Polonium 210 precision (±)	1.0E-03	uCi/kg				RMO-3008	06/02/08 11:15 / plj
Lead 210	0.0E+00	uCi/kg	UD	1.0E-03		E909.0M	05/21/08 09:00 / dm
Lead 210 precision (±)	8.0E-03	uCi/kg				E909.0M	05/21/08 09:00 / dm
Thorium 230	0.0E+00	uCi/kg	UD	3.0E-04		E907.0	05/09/08 14:00 / dmf
Thorium 230 precision (±)	4.0E-04	uCi/kg				E907.0	05/09/08 14:00 / dmf
Radium 226	-1.0E-03	uCi/kg	U			E903.0	05/15/08 15:31 / trs
Radium 226 precision (±)	1.0E-03	uCi/kg				E903.0	05/15/08 15:31 / trs
Radium 226 MDC	2.0E-03	uCi/kg				E903.0	05/15/08 15:31 / trs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
U - Not detected at minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey-Burdock 010996.07
Lab ID: C08040910-006
Client Sample ID: BVC04-~~Quill-Back~~ River Carpsucker

Report Date: 06/19/08
Collection Date: 04/16/08
DateReceived: 04/18/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	ND	mg/kg	D	0.03		SW6020	05/11/08 01:51 / ts
Uranium, Activity	ND	uCi/kg	D	2.0E-05		SW6020	05/11/08 01:51 / ts
RADIONUCLIDES - TOTAL							
Polonium 210	4.0E-04	uCi/kg		5.0E-05		RMO-3008	06/02/08 11:15 / plj
Polonium 210 precision (±)	2.0E-04	uCi/kg				RMO-3008	06/02/08 11:15 / plj
Lead 210	0.0E+00	uCi/kg	U	5.0E-05		E909.0M	05/21/08 09:00 / dm
Lead 210 precision (±)	3.0E-04	uCi/kg				E909.0M	05/21/08 09:00 / dm
Thorium 230	2.0E-05	uCi/kg		1.0E-05		E907.0	05/09/08 14:00 / dmf
Thorium 230 precision (±)	3.0E-05	uCi/kg				E907.0	05/09/08 14:00 / dmf
Radium 226	-2.0E-05	uCi/kg	U			E903.0	05/15/08 15:31 / trs
Radium 226 precision (±)	6.0E-05	uCi/kg				E903.0	05/15/08 15:31 / trs
Radium 226 MDC	1.0E-04	uCi/kg				E903.0	05/15/08 15:31 / trs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
U - Not detected at minimum detectable concentration
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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey-Burdock 010996.07
Lab ID: C08040910-007
Client Sample ID: BVC04-Green Sunfish

Report Date: 06/19/08
Collection Date: 04/16/08
DateReceived: 04/18/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	ND	mg/kg	D	0.3		SW6020	05/11/08 01:55 / ts
Uranium, Activity	ND	uCi/kg	D	2.0E-04		SW6020	05/11/08 01:55 / ts
RADIONUCLIDES - TOTAL							
Polonium 210	6.0E-04	uCi/kg	D	4.0E-04		RMO-3008	06/02/08 11:15 / plj
Polonium 210 precision (±)	7.0E-04	uCi/kg				RMO-3008	06/02/08 11:15 / plj
Lead 210	0.0E+00	uCi/kg	UD	4.0E-04		E909.0M	05/21/08 09:00 / dm
Lead 210 precision (±)	3.0E-03	uCi/kg				E909.0M	05/21/08 09:00 / dm
Thorium 230	8.0E-04	uCi/kg	D	9.0E-05		E907.0	05/09/08 14:00 / dmf
Thorium 230 precision (±)	6.0E-04	uCi/kg				E907.0	05/09/08 14:00 / dmf
Radium 226	-3.0E-04	uCi/kg	U			E903.0	05/15/08 15:31 / trs
Radium 226 precision (±)	4.0E-04	uCi/kg				E903.0	05/15/08 15:31 / trs
Radium 226 MDC	9.0E-04	uCi/kg				E903.0	05/15/08 15:31 / trs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
U - Not detected at minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey-Burdock 010996.07
Lab ID: C08040910-008
Client Sample ID: BVC04-~~Emerald Shiner~~ Fathead Minnow

Report Date: 06/19/08
Collection Date: 04/16/08
DateReceived: 04/18/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	ND	mg/kg		0.02		SW6020	05/11/08 01:59 / ts
Uranium, Activity	ND	uCi/kg		1.0E-05		SW6020	05/11/08 01:59 / ts
RADIONUCLIDES - TOTAL							
Polonium 210	0.0E+00	uCi/kg	U	5.0E-05		RMO-3008	06/02/08 11:15 / plj
Polonium 210 precision (±)	2.0E-05	uCi/kg				RMO-3008	06/02/08 11:15 / plj
Lead 210	0.0E+00	uCi/kg	U	5.0E-05		E909.0M	05/21/08 09:00 / dm
Lead 210 precision (±)	9.0E-05	uCi/kg				E909.0M	05/21/08 09:00 / dm
Thorium 230	1.0E-05	uCi/kg		1.0E-05		E907.0	05/09/08 14:00 / dmf
Thorium 230 precision (±)	1.0E-05	uCi/kg				E907.0	05/09/08 14:00 / dmf
Radium 226	1.0E-04	uCi/kg				E903.0	05/15/08 15:31 / trs
Radium 226 precision (±)	3.0E-05	uCi/kg				E903.0	05/15/08 15:31 / trs
Radium 226 MDC	3.0E-05	uCi/kg				E903.0	05/15/08 15:31 / trs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey-Burdock 010996.07
Lab ID: C08040910-009
Client Sample ID: BVC04-Channel Catfish

Report Date: 06/19/08
Collection Date: 04/16/08
DateReceived: 04/18/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	0.05	mg/kg	D	0.05		SW6020	05/11/08 02:03 / ts
Uranium, Activity	3.0E-05	uCi/kg	D	3.0E-05		SW6020	05/11/08 02:03 / ts
RADIONUCLIDES - TOTAL							
Polonium 210	9.0E-04	uCi/kg	D	8.0E-05		RMO-3008	06/02/08 11:15 / plj
Polonium 210 precision (±)	3.0E-04	uCi/kg				RMO-3008	06/02/08 11:15 / plj
Lead 210	0.0E+00	uCi/kg	UD	8.0E-05		E909.0M	05/21/08 09:00 / dm
Lead 210 precision (±)	5.0E-04	uCi/kg				E909.0M	05/21/08 09:00 / dm
Thorium 230	2.0E-05	uCi/kg	D	2.0E-05		E907.0	05/09/08 14:00 / dmf
Thorium 230 precision (±)	3.0E-05	uCi/kg				E907.0	05/09/08 14:00 / dmf
Radium 226	-8.0E-05	uCi/kg	U			E903.0	05/15/08 15:31 / trs
Radium 226 precision (±)	6.0E-05	uCi/kg				E903.0	05/15/08 15:31 / trs
Radium 226 MDC	1.0E-04	uCi/kg				E903.0	05/15/08 15:31 / trs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
U - Not detected at minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey-Burdock 010996.07
Lab ID: C08040910-010
Client Sample ID: CHR05-~~Quill-Back~~ River Carpsucker

Report Date: 06/19/08
Collection Date: 04/15/08
DateReceived: 04/18/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	ND	mg/kg	D	0.04		SW6020	05/11/08 02:07 / ts
Uranium, Activity	ND	uCi/kg	D	3.0E-05		SW6020	05/11/08 02:07 / ts
RADIONUCLIDES - TOTAL							
Polonium 210	8.0E-04	uCi/kg	D	7.0E-05		RMO-3008	06/02/08 11:15 / plj
Polonium 210 precision (±)	3.0E-04	uCi/kg				RMO-3008	06/02/08 11:15 / plj
Lead 210	0.0E+00	uCi/kg	UD	7.0E-05		E909.0M	05/21/08 09:00 / dm
Lead 210 precision (±)	4.0E-04	uCi/kg				E909.0M	05/21/08 09:00 / dm
Thorium 230	0.0E+00	uCi/kg	U	1.0E-05		E907.0	05/09/08 14:00 / dmf
Thorium 230 precision (±)	5.0E-05	uCi/kg				E907.0	05/09/08 14:00 / dmf
Radium 226	-9.0E-05	uCi/kg	U			E903.0	05/15/08 17:06 / trs
Radium 226 precision (±)	5.0E-05	uCi/kg				E903.0	05/15/08 17:06 / trs
Radium 226 MDC	1.0E-04	uCi/kg				E903.0	05/15/08 17:06 / trs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
U - Not detected at minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey-Burdock 010996.07
Lab ID: C08040910-011
Client Sample ID: CHR05-Green Sunfish

Report Date: 06/19/08
Collection Date: 04/15/08
DateReceived: 04/18/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	ND	mg/kg	D	0.04		SW6020	05/11/08 02:11 / ts
Uranium, Activity	ND	uCi/kg	D	3.0E-05		SW6020	05/11/08 02:11 / ts
RADIONUCLIDES - TOTAL							
Polonium 210	8.0E-05	uCi/kg	UD	7.0E-05		RMO-3008	06/02/08 11:15 / plj
Polonium 210 precision (±)	1.0E-04	uCi/kg				RMO-3008	06/02/08 11:15 / plj
Lead 210	0.0E+00	uCi/kg	UD	7.0E-05		E909.0M	05/21/08 09:00 / dm
Lead 210 precision (±)	4.0E-04	uCi/kg				E909.0M	05/21/08 09:00 / dm
Thorium 230	1.0E-05	uCi/kg	U	1.0E-05		E907.0	05/09/08 14:00 / dmf
Thorium 230 precision (±)	5.0E-05	uCi/kg				E907.0	05/09/08 14:00 / dmf
Radium 226	-6.0E-05	uCi/kg	U			E903.0	05/15/08 17:06 / trs
Radium 226 precision (±)	7.0E-05	uCi/kg				E903.0	05/15/08 17:06 / trs
Radium 226 MDC	1.0E-04	uCi/kg				E903.0	05/15/08 17:06 / trs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
U - Not detected at minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey-Burdock 010996.07
Lab ID: C08040910-012
Client Sample ID: CHR05-~~Mottled Sucker~~ Shorthead Redhorse Sucker

Report Date: 06/19/08
Collection Date: 04/15/08
DateReceived: 04/18/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	ND	mg/kg		0.02		SW6020	05/11/08 02:15 / ts
Uranium, Activity	ND	uCi/kg		1.0E-05		SW6020	05/11/08 02:15 / ts
RADIONUCLIDES - TOTAL							
Polonium 210	2.0E-04	uCi/kg		5.0E-05		RMO-3008	06/02/08 11:15 / plj
Polonium 210 precision (±)	1.0E-04	uCi/kg				RMO-3008	06/02/08 11:15 / plj
Lead 210	0.0E+00	uCi/kg	U	5.0E-05		E909.0M	05/21/08 09:00 / dm
Lead 210 precision (±)	1.0E-04	uCi/kg				E909.0M	05/21/08 09:00 / dm
Thorium 230	2.0E-05	uCi/kg		1.0E-05		E907.0	05/09/08 14:00 / dmf
Thorium 230 precision (±)	2.0E-05	uCi/kg				E907.0	05/09/08 14:00 / dmf
Radium 226	-1.0E-05	uCi/kg	U			E903.0	05/16/08 15:11 / trs
Radium 226 precision (±)	2.0E-05	uCi/kg				E903.0	05/16/08 15:11 / trs
Radium 226 MDC	3.0E-05	uCi/kg				E903.0	05/16/08 15:11 / trs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey-Burdock 010996.07
Lab ID: C08040910-013
Client Sample ID: CHR05-~~Fine Scale Dace~~ Creek Chub

Report Date: 06/19/08
Collection Date: 04/15/08
DateReceived: 04/18/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	ND	mg/kg	D	0.2		SW6020	05/11/08 02:36 / ts
Uranium, Activity	ND	uCi/kg	D	1.0E-04		SW6020	05/11/08 02:36 / ts
RADIONUCLIDES - TOTAL							
Polonium 210	0.0E+00	uCi/kg	UD	3.0E-04		RMO-3008	06/02/08 11:15 / plj
Polonium 210 precision (±)	3.0E-04	uCi/kg				RMO-3008	06/02/08 11:15 / plj
Lead 210	0.0E+00	uCi/kg	UD	3.0E-04		E909.0M	05/21/08 09:00 / dm
Lead 210 precision (±)	2.0E-03	uCi/kg				E909.0M	05/21/08 09:00 / dm
Thorium 230	0.0E+00	uCi/kg	UD	7.0E-05		E907.0	05/09/08 14:00 / dmf
Thorium 230 precision (±)	2.0E-04	uCi/kg				E907.0	05/09/08 14:00 / dmf
Radium 226	-2.0E-04	uCi/kg	U			E903.0	05/16/08 15:11 / trs
Radium 226 precision (±)	3.0E-04	uCi/kg				E903.0	05/16/08 15:11 / trs
Radium 226 MDC	6.0E-04	uCi/kg				E903.0	05/16/08 15:11 / trs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
U - Not detected at minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey-Burdock 010996.07
Lab ID: C08040910-014
Client Sample ID: CHR05-Plains Killfish

Report Date: 06/19/08
Collection Date: 04/15/08
DateReceived: 04/18/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	ND	mg/kg	D	0.4		SW6020	05/11/08 02:40 / ts
Uranium, Activity	ND	uCi/kg	D	3.0E-04		SW6020	05/11/08 02:40 / ts
RADIONUCLIDES - TOTAL							
Polonium 210	0.0E+00	uCi/kg	UD	6.0E-04		RMO-3008	06/02/08 11:15 / plj
Polonium 210 precision (±)	1.0E-03	uCi/kg				RMO-3008	06/02/08 11:15 / plj
Lead 210	0.0E+00	uCi/kg	UD	6.0E-04		E909.0M	05/21/08 09:00 / dm
Lead 210 precision (±)	3.0E-03	uCi/kg				E909.0M	05/21/08 09:00 / dm
Thorium 230	1.0E-03	uCi/kg	D	1.0E-04		E907.0	05/09/08 14:00 / dmf
Thorium 230 precision (±)	8.0E-04	uCi/kg				E907.0	05/09/08 14:00 / dmf
Radium 226	-5.0E-04	uCi/kg	U			E903.0	05/16/08 15:11 / trs
Radium 226 precision (±)	5.0E-04	uCi/kg				E903.0	05/16/08 15:11 / trs
Radium 226 MDC	1.0E-03	uCi/kg				E903.0	05/16/08 15:11 / trs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
U - Not detected at minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey-Burdock 010996.07
Lab ID: C08040910-015
Client Sample ID: CHR05-~~Shiner~~ Sand Shiner

Report Date: 06/19/08
Collection Date: 04/15/08
DateReceived: 04/18/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	ND	mg/kg	D	0.4		SW6020	05/11/08 02:44 / ts
Uranium, Activity	ND	uCi/kg	D	3.0E-04		SW6020	05/11/08 02:44 / ts
RADIONUCLIDES - TOTAL							
Polonium 210	0.0E+00	uCi/kg	UD	6.0E-04		RMO-3008	06/02/08 11:15 / plj
Polonium 210 precision (±)	5.0E-04	uCi/kg				RMO-3008	06/02/08 11:15 / plj
Lead 210	0.0E+00	uCi/kg	UD	6.0E-04		E909.0M	05/21/08 09:00 / dm
Lead 210 precision (±)	3.0E-03	uCi/kg				E909.0M	05/21/08 09:00 / dm
Thorium 230	1.0E-03	uCi/kg	D	1.0E-04		E907.0	05/09/08 14:00 / dmf
Thorium 230 precision (±)	7.0E-04	uCi/kg				E907.0	05/09/08 14:00 / dmf
Radium 226	-3.0E-04	uCi/kg	U			E903.0	05/15/08 17:06 / trs
Radium 226 precision (±)	6.0E-04	uCi/kg				E903.0	05/15/08 17:06 / trs
Radium 226 MDC	1.0E-03	uCi/kg				E903.0	05/15/08 17:06 / trs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
U - Not detected at minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix interference.

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QA/QC Summary Report

Client: Jones and Stokes
Project: Dewey-Burdock 010996.07

Report Date: 06/19/08
Work Order: C08040910

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0									Batch: 18521
Sample ID: C08041154-001AMS	Sample Matrix Spike				Run: BERTHOLD 770_080508E				05/15/08 17:06
Radium 226	0.14	pCi/L		84	70	130			
Sample ID: C08041154-001AMSD	Sample Matrix Spike Duplicate				Run: BERTHOLD 770_080508E				05/15/08 17:06
Radium 226	0.14	pCi/L		87	70	130	0.4	23.7	
Sample ID: MB-18521	Method Blank				Run: BERTHOLD 770_080508E				05/16/08 15:11
Radium 226	-0.7	pCi/L							U
Sample ID: LCS-18521	Laboratory Control Sample				Run: BERTHOLD 770_080508E				05/16/08 08:10
Radium 226	15	pCi/L		97	70	130			
Method: E907.0									Batch: 18521
Sample ID: C08041154-001AMS	Sample Matrix Spike				Run: EGG-ORTEC_080509A				05/09/08 14:00
Thorium 230	0.23	pCi/g-dry	0.10	113	70	130			
Sample ID: C08041154-001AMSD	Sample Matrix Spike Duplicate				Run: EGG-ORTEC_080509A				05/09/08 14:00
Thorium 230	0.15	pCi/g-dry	0.10	81	70	130	41	30	R
- The RPD for the MSD is high. The individual spike recoveries are within range, the MB is acceptable, and the LCS is within range, therefore the batch is approved.									
Sample ID: LCS-18521	Laboratory Control Sample				Run: EGG-ORTEC_080509A				05/09/08 14:00
Thorium 230	0.0431	pCi/g-dry	0.10	93	70	130			
Sample ID: MB-18521	Method Blank				Run: EGG-ORTEC_080509A				05/09/08 14:00
Thorium 230	-0.0006	pCi/g-dry							
Method: E909.0M									Batch: 18521
Sample ID: C08041154-001AMS	Sample Matrix Spike				Run: PACKARD 3100TR_080521A				05/21/08 09:00
Lead 210	3.5	pCi/g-dry	0.10	130	70	130			
- Spike response is outside of the acceptance range for this analysis. Since the LCS and the MSD are acceptable the batch is approved.									
Sample ID: C08041154-001AMSD	Sample Matrix Spike Duplicate				Run: PACKARD 3100TR_080521A				05/21/08 09:00
Lead 210	2.5	pCi/g-dry	0.10	91	70	130	36	30	R
Sample ID: MB-R101975	Method Blank				Run: PACKARD 3100TR_080521A				05/21/08 09:00
Lead 210	ND	pCi/g-dry							
Sample ID: LCS-R101975	Laboratory Control Sample				Run: PACKARD 3100TR_080521A				05/21/08 09:00
Lead 210	0.0528	pCi/g-dry	0.10	76	70	130			

Qualifiers:

RL - Analyte reporting limit.
R - RPD exceeds advisory limit.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

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QA/QC Summary Report

Client: Jones and Stokes
Project: Dewey-Burdock 010996.07

Report Date: 06/19/08
Work Order: C08040910

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E909.0M									Batch: R102568
Sample ID: C08050798-003AMS	Sample Matrix Spike				Run: PACKARD 3100TR_080609A				06/09/08 08:30
Lead 210	648	pCi/Filter		48	70	130			S
- Spike response is outside of the acceptance range for this analysis. Since the LCS and the MSD are acceptable the batch is approved.									
Sample ID: C08050798-003AMSD	Sample Matrix Spike Duplicate				Run: PACKARD 3100TR_080609A				06/09/08 08:30
Lead 210	1350	pCi/Filter		108	70	130	70	30	R
Sample ID: MB-R102568	Method Blank				Run: PACKARD 3100TR_080609A				06/09/08 08:30
Lead 210	10	pCi/L							
Sample ID: LCS-R102568	Laboratory Control Sample				Run: PACKARD 3100TR_080609A				06/09/08 08:30
Lead 210	110	pCi/L		84	70	130			
Method: RMO-3008									Batch: 18521
Sample ID: C08040910-015AMS	Sample Matrix Spike				Run: EGG-ORTEC_080602A				06/02/08 11:15
Polonium 210	105	pCi/g-dry	0.10	96	70	130			
Sample ID: C08040910-015AMSD	Sample Matrix Spike Duplicate				Run: EGG-ORTEC_080602A				06/02/08 11:15
Polonium 210	117	pCi/g-dry	0.10	107	70	130	11	30	
Sample ID: LCS-18521	Laboratory Control Sample				Run: EGG-ORTEC_080602A				06/02/08 11:15
Polonium 210	79.2	pCi/g-dry	0.10	91	70	130			
Sample ID: MB-18521	Method Blank				Run: EGG-ORTEC_080602A				06/02/08 11:15
Polonium 210	-0.3	pCi/g-dry							
Method: SW6020									Batch: 18521
Sample ID: MB-18521	Method Blank				Run: ICPMS2-C_080510B				05/11/08 01:01
Uranium	8E-05	mg/kg-dry	6E-05						
Sample ID: LCS1-18521	Laboratory Control Sample				Run: ICPMS2-C_080510B				05/11/08 01:05
Uranium	0.515	mg/kg-dry	0.015	103	75	125			
Sample ID: C08040910-015AMS	Sample Matrix Spike				Run: ICPMS2-C_080510B				05/11/08 02:48
Uranium	316	mg/kg-dry	0.38	100	75	125			
Sample ID: C08040910-015AMSD	Sample Matrix Spike Duplicate				Run: ICPMS2-C_080510B				05/11/08 02:52
Uranium	316	mg/kg-dry	0.38	101	75	125	0.2	20	

Qualifiers:

RL - Analyte reporting limit.
R - RPD exceeds advisory limit.
ND - Not detected at the reporting limit.
S - Spike recovery outside of advisory limits.

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Date: 19-Jun-08

CLIENT: Jones and Stokes
Project: Dewey-Burdock 010996.07
Sample Delivery Group: C08040910

CASE NARRATIVE

THIS IS THE FINAL PAGE OF THE LABORATORY ANALYTICAL REPORT

ORIGINAL SAMPLE SUBMITTAL(S)
All original sample submittals have been returned with the data package.

SAMPLE TEMPERATURE COMPLIANCE: 4°C (±2°C)
Temperature of samples received may not be considered properly preserved by accepted standards. Samples that are hand delivered immediately after collection shall be considered acceptable if there is evidence that the chilling process has begun.

GROSS ALPHA ANALYSIS
Method 900.0 for gross alpha and gross beta is intended as a drinking water method for low TDS waters. Data provided by this method for non potable waters should be viewed as inconsistent.

RADON IN AIR ANALYSIS
The desired exposure time is 48 hours (2 days). The time delay in returning the canister to the laboratory for processing should be as short as possible to avoid excessive decay. Maximum recommended delay between end of exposure to beginning of counting should not exceed 8 days.

SOIL/SOLID SAMPLES
All samples reported on an as received basis unless otherwise indicated.

ATRAZINE, SIMAZINE AND PCB ANALYSIS USING EPA 505
Data for Atrazine and Simazine are reported from EPA 525.2, not from EPA 505. Data reported by ELI using EPA method 505 reflects the results for seven individual Aroclors. When the results for all seven are ND (not detected), the sample meets EPA compliance criteria for PCB monitoring.

SUBCONTRACTING ANALYSIS
Subcontracting of sample analyses to an outside laboratory may be required. If so, ENERGY LABORATORIES will utilize its branch laboratories or qualified contract laboratories for this service. Any such laboratories will be indicated within the Laboratory Analytical Report.

BRANCH LABORATORY LOCATIONS
eli-b - Energy Laboratories, Inc. - Billings, MT
eli-g - Energy Laboratories, Inc. - Gillette, WY
eli-h - Energy Laboratories, Inc. - Helena, MT
eli-r - Energy Laboratories, Inc. - Rapid City, SD
eli-t - Energy Laboratories, Inc. - College Station, TX

CERTFICATIONS:
USEPA: WY00002; FL-DOH NELAC: E87641; Arizona: AZ0699; California: 02118CA
Oregon: WY200001; Utah: 3072350515; Virginia: 00057; Washington: C1903

ISO 17025 DISCLAIMER:
The results of this Analytical Report relate only to the items submitted for analysis.

ENERGY LABORATORIES, INC. - CASPER,WY certifies that certain method selections contained in this report meet requirements as set forth by the above accrediting authorities. Some results requested by the client may not be covered under these certifications. All analysis data to be submitted for regulatory enforcement should be certified in the sample state of origin. Please verify ELI's certification coverage by visiting www.energylab.com

ELI appreciates the opportunity to provide you with this analytical service. For additional information and services visit our web page www.energylab.com.

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ANALYTICAL SUMMARY REPORT

August 22, 2008

Sample ID species corrected.
A. Wones ICF Jones & Stokes

Jones and Stokes
1901 Energy Ct Ste 115
Gillette, WY 82718

Workorder No.: C08070647

Project Name: Dewey Burdock 00996.07

Energy Laboratories, Inc. received the following 17 samples from Jones and Stokes on 7/15/2008 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test	
C08070647-001	BVC01-ICF JSA-FHM	07/10/08 00:00	07/15/08	Fish	Uranium, Total Digestion For RadioChemistry Lead 210 Polonium 210 Radium 226 Thorium, Isotopic	
C08070647-002	BVC01-Plains Top Minow	07/10/08 00:00	07/15/08	Fish	Same As Above	
C08070647-003	BVC01-Plains Kill Fish	07/10/08 00:00	07/15/08	Fish	Same As Above	
C08070647-004	BVC01-~~Gommon Shiner~~	07/10/08 00:00	07/15/08	Fish	Same As Above	Sand Shiner
C08070647-005	BVC01-ICF JSA- CAP Carp	07/10/08 00:00	07/15/08	Fish	Same As Above	
C08070647-006	BVC04-~~Gommon Shiner~~	07/10/08 00:00	07/15/08	Fish	Same As Above	Sand Shiner
C08070647-007	BVC04-Short Head Red Horse Sucker	07/10/08 00:00	07/15/08	Fish	Same As Above	
C08070647-008	BVC04-Fathead Minow	07/10/08 00:00	07/15/08	Fish	Same As Above	
C08070647-009	BVC04-PLK	07/10/08 00:00	07/15/08	Fish	Same As Above	
C08070647-010	BVC04-Carp (Cap)	07/10/08 00:00	07/15/08	Fish	Same As Above	
C08070647-011	CHR04-~~WSM~~	07/09/08 00:00	07/15/08	Fish	Same As Above	Sand Shiner
C08070647-012	CHR04-FHM	07/09/08 00:00	07/15/08	Fish	Same As Above	
C08070647-013	CHR04-PLK	07/09/08 00:00	07/15/08	Fish	Same As Above	
C08070647-014	CHR04-SRS	07/09/08 00:00	07/15/08	Fish	Same As Above	
C08070647-015	CHR04-Carp	07/09/08 00:00	07/15/08	Fish	Same As Above	
C08070647-016	CHR04-CHC	07/09/08 00:00	07/15/08	Fish	Same As Above	
C08070647-017	CHR04-RCS	07/09/08 00:00	07/15/08	Fish	Composite of two or more samples Uranium, Total Digestion For RadioChemistry Lead 210 Polonium 210 Radium 226 Thorium, Isotopic	

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As appropriate, any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these tests results, please call.

Report Approved By: STEVE CARLSTON

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey Burdock 00996.07
Lab ID: C08070647-001
Client Sample ID: BVC01-ICF JSA-FHM

Report Date: 08/22/08
Collection Date: 07/10/08
DateReceived: 07/15/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	0.026	mg/kg-dry		0.0050		SW6020	07/27/08 05:51 / sml
Uranium, Activity	1.8E-05	uCi/kg		3.4E-06		SW6020	07/27/08 05:51 / sml
RADIONUCLIDES - TOTAL							
Polonium 210	4.0E-04	uCi/kg		9.3E-05		RMO-3008	07/31/08 14:15 / plj
Polonium 210 precision (±)	2.3E-04	uCi/kg				RMO-3008	07/31/08 14:15 / plj
Lead 210	1.4E-03	uCi/kg	U			E909.0M	07/28/08 11:15 / dm
Lead 210 precision (±)	3.6E-03	uCi/kg				E909.0M	07/28/08 11:15 / dm
Lead 210 MDC	6.0E-03	uCi/kg				E909.0M	07/28/08 11:15 / dm
Radium 226	-2.2E-04	uCi/kg	U			E903.0	08/07/08 10:33 / dm
Radium 226 precision (±)	1.2E-04	uCi/kg				E903.0	08/07/08 10:33 / dm
Radium 226 MDC	2.9E-04	uCi/kg				E903.0	08/07/08 10:33 / dm
Thorium 230	-1.2E-05	uCi/kg	U	1.9E-05		E907.0	08/08/08 00:16 / dmf
Thorium 230 precision (±)	6.2E-05	uCi/kg				E907.0	08/08/08 00:16 / dmf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey Burdock 00996.07
Lab ID: C08070647-002
Client Sample ID: BVC01-Plains Top Minow

Report Date: 08/22/08
Collection Date: 07/10/08
DateReceived: 07/15/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	0.021	mg/kg-dry		0.0050		SW6020	07/27/08 06:12 / sml
Uranium, Activity	1.4E-05	uCi/kg		3.4E-06		SW6020	07/27/08 06:12 / sml
RADIONUCLIDES - TOTAL							
Polonium 210	3.5E-04	uCi/kg		1.1E-04		RMO-3008	07/31/08 14:15 / plj
Polonium 210 precision (±)	2.8E-04	uCi/kg				RMO-3008	07/31/08 14:15 / plj
Lead 210	-2.0E-03	uCi/kg	U			E909.0M	07/28/08 11:15 / dm
Lead 210 precision (±)	4.2E-03	uCi/kg				E909.0M	07/28/08 11:15 / dm
Lead 210 MDC	7.1E-03	uCi/kg				E909.0M	07/28/08 11:15 / dm
Radium 226	-2.0E-04	uCi/kg	U			E903.0	08/07/08 10:33 / dm
Radium 226 precision (±)	1.1E-04	uCi/kg				E903.0	08/07/08 10:33 / dm
Radium 226 MDC	2.7E-04	uCi/kg				E903.0	08/07/08 10:33 / dm
Thorium 230	1.0E-04	uCi/kg		2.2E-05		E907.0	08/08/08 00:16 / dmf
Thorium 230 precision (±)	1.0E-04	uCi/kg				E907.0	08/08/08 00:16 / dmf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey Burdock 00996.07
Lab ID: C08070647-003
Client Sample ID: BVC01-Plains Kill Fish

Report Date: 08/22/08
Collection Date: 07/10/08
DateReceived: 07/15/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	0.035	mg/kg-dry		0.0050		SW6020	07/27/08 06:16 / sml
Uranium, Activity	2.4E-05	uCi/kg		3.4E-06		SW6020	07/27/08 06:16 / sml
RADIONUCLIDES - TOTAL							
Polonium 210	4.7E-04	uCi/kg		1.1E-04		RMO-3008	07/31/08 14:15 / plj
Polonium 210 precision (±)	3.1E-04	uCi/kg				RMO-3008	07/31/08 14:15 / plj
Lead 210	1.2E-03	uCi/kg	U			E909.0M	07/28/08 11:15 / dm
Lead 210 precision (±)	4.2E-03	uCi/kg				E909.0M	07/28/08 11:15 / dm
Lead 210 MDC	7.1E-03	uCi/kg				E909.0M	07/28/08 11:15 / dm
Radium 226	-2.0E-04	uCi/kg	U			E903.0	08/07/08 10:33 / dm
Radium 226 precision (±)	1.1E-04	uCi/kg				E903.0	08/07/08 10:33 / dm
Radium 226 MDC	2.8E-04	uCi/kg				E903.0	08/07/08 10:33 / dm
Thorium 230	5.7E-06	uCi/kg	U	2.2E-05		E907.0	08/08/08 00:16 / dmf
Thorium 230 precision (±)	1.0E-04	uCi/kg				E907.0	08/08/08 00:16 / dmf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey Burdock 00996.07
Lab ID: C08070647-004
Client Sample ID: BVC01-~~Common Shiner~~ SAS sand shiner

Report Date: 08/22/08
Collection Date: 07/10/08
DateReceived: 07/15/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	0.031	mg/kg-dry		0.0050		SW6020	07/27/08 06:20 / sml
Uranium, Activity	2.1E-05	uCi/kg		3.4E-06		SW6020	07/27/08 06:20 / sml
RADIONUCLIDES - TOTAL							
Polonium 210	2.3E-04	uCi/kg		1.6E-04		RMO-3008	07/31/08 14:15 / plj
Polonium 210 precision (±)	2.6E-04	uCi/kg				RMO-3008	07/31/08 14:15 / plj
Lead 210	3.8E-03	uCi/kg	U			E909.0M	07/28/08 11:15 / dm
Lead 210 precision (±)	6.1E-03	uCi/kg				E909.0M	07/28/08 11:15 / dm
Lead 210 MDC	1.0E-02	uCi/kg				E909.0M	07/28/08 11:15 / dm
Radium 226	-3.0E-04	uCi/kg	U			E903.0	08/07/08 10:33 / dm
Radium 226 precision (±)	1.6E-04	uCi/kg				E903.0	08/07/08 10:33 / dm
Radium 226 MDC	4.0E-04	uCi/kg				E903.0	08/07/08 10:33 / dm
Thorium 230	9.8E-05	uCi/kg		3.2E-05		E907.0	08/08/08 00:16 / dmf
Thorium 230 precision (±)	1.6E-04	uCi/kg				E907.0	08/08/08 00:16 / dmf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

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LABORATORY ANALYTICAL REPORT

Client:	Jones and Stokes	**Report Date:**	08/22/08
Project:	Dewey Burdock 00996.07	**Collection Date:**	07/10/08
Lab ID:	C08070647-005	**DateReceived:**	07/15/08
Client Sample ID:	BVC01-ICF JSA- CAP Carp	**Matrix:**	Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	0.0098	mg/kg-dry		0.0050		SW6020	07/27/08 06:24 / sml
Uranium, Activity	6.7E-06	uCi/kg		3.4E-06		SW6020	07/27/08 06:24 / sml
RADIONUCLIDES - TOTAL							
Polonium 210	7.8E-04	uCi/kg		5.0E-05		RMO-3008	07/31/08 14:15 / plj
Polonium 210 precision (±)	1.9E-04	uCi/kg				RMO-3008	07/31/08 14:15 / plj
Lead 210	7.6E-05	uCi/kg	U			E909.0M	07/28/08 11:15 / dm
Lead 210 precision (±)	5.0E-04	uCi/kg				E909.0M	07/28/08 11:15 / dm
Lead 210 MDC	8.4E-04	uCi/kg				E909.0M	07/28/08 11:15 / dm
Radium 226	-2.3E-05	uCi/kg	U			E903.0	08/07/08 10:33 / dm
Radium 226 precision (±)	1.6E-05	uCi/kg				E903.0	08/07/08 10:33 / dm
Radium 226 MDC	3.6E-05	uCi/kg				E903.0	08/07/08 10:33 / dm
Thorium 230	-7.4E-07	uCi/kg	U	2.6E-06		E907.0	08/08/08 00:16 / dmf
Thorium 230 precision (±)	9.2E-06	uCi/kg				E907.0	08/08/08 00:16 / dmf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey Burdock 00996.07
Lab ID: C08070647-006
Client Sample ID: BVC04-~~Common Shiner~~ Sand Shiner

Report Date: 08/22/08
Collection Date: 07/10/08
DateReceived: 07/15/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	0.024	mg/kg-dry		0.0050		SW6020	07/27/08 06:28 / sml
Uranium, Activity	1.6E-05	uCi/kg		3.4E-06		SW6020	07/27/08 06:28 / sml
RADIONUCLIDES - TOTAL							
Polonium 210	5.4E-04	uCi/kg		1.1E-04		RMO-3008	07/31/08 14:15 / plj
Polonium 210 precision (±)	5.4E-04	uCi/kg				RMO-3008	07/31/08 14:15 / plj
Lead 210	6.4E-04	uCi/kg	U			E909.0M	07/28/08 11:15 / dm
Lead 210 precision (±)	4.4E-03	uCi/kg				E909.0M	07/28/08 11:15 / dm
Lead 210 MDC	7.3E-03	uCi/kg				E909.0M	07/28/08 11:15 / dm
Radium 226	-7.7E-05	uCi/kg	U			E903.0	08/07/08 10:33 / dm
Radium 226 precision (±)	1.3E-04	uCi/kg				E903.0	08/07/08 10:33 / dm
Radium 226 MDC	2.5E-04	uCi/kg				E903.0	08/07/08 10:33 / dm
Thorium 230	2.7E-05	uCi/kg		2.3E-05		E907.0	08/08/08 00:16 / dmf
Thorium 230 precision (±)	1.0E-04	uCi/kg				E907.0	08/08/08 00:16 / dmf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey Burdock 00996.07
Lab ID: C08070647-007
Client Sample ID: BVC04-Short Head Red Horse Sucker

Report Date: 08/22/08
Collection Date: 07/10/08
DateReceived: 07/15/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	0.0072	mg/kg-dry		0.0050		SW6020	07/27/08 06:32 / sml
Uranium, Activity	4.9E-06	uCi/kg		3.4E-06		SW6020	07/27/08 06:32 / sml
RADIONUCLIDES - TOTAL							
Polonium 210	1.7E-04	uCi/kg		5.0E-05		RMO-3008	07/31/08 14:15 / plj
Polonium 210 precision (±)	1.0E-04	uCi/kg				RMO-3008	07/31/08 14:15 / plj
Lead 210	1.2E-04	uCi/kg	U			E909.0M	07/28/08 11:15 / dm
Lead 210 precision (±)	1.2E-03	uCi/kg				E909.0M	07/28/08 11:15 / dm
Lead 210 MDC	2.0E-03	uCi/kg				E909.0M	07/28/08 11:15 / dm
Radium 226	-3.7E-05	uCi/kg	U			E903.0	08/07/08 10:33 / dm
Radium 226 precision (±)	3.2E-05	uCi/kg				E903.0	08/07/08 10:33 / dm
Radium 226 MDC	6.9E-05	uCi/kg				E903.0	08/07/08 10:33 / dm
Thorium 230	1.9E-06	uCi/kg	U	6.3E-06		E907.0	08/08/08 00:16 / dmf
Thorium 230 precision (±)	2.3E-05	uCi/kg				E907.0	08/08/08 00:16 / dmf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey Burdock 00996.07
Lab ID: C08070647-008
Client Sample ID: BVC04-Fathead Minow

Report Date: 08/22/08
Collection Date: 07/10/08
DateReceived: 07/15/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	0.031	mg/kg-dry		0.0050		SW6020	07/27/08 06:36 / sml
Uranium, Activity	2.1E-05	uCi/kg		3.4E-06		SW6020	07/27/08 06:36 / sml
RADIONUCLIDES - TOTAL							
Polonium 210	1.8E-04	uCi/kg		1.2E-04		RMO-3008	07/31/08 14:15 / plj
Polonium 210 precision (±)	3.1E-04	uCi/kg				RMO-3008	07/31/08 14:15 / plj
Lead 210	7.9E-04	uCi/kg	U			E909.0M	07/28/08 11:15 / dm
Lead 210 precision (±)	4.7E-03	uCi/kg				E909.0M	07/28/08 11:15 / dm
Lead 210 MDC	7.9E-03	uCi/kg				E909.0M	07/28/08 11:15 / dm
Radium 226	-1.2E-04	uCi/kg	U			E903.0	08/07/08 10:33 / dm
Radium 226 precision (±)	1.6E-04	uCi/kg				E903.0	08/07/08 10:33 / dm
Radium 226 MDC	3.2E-04	uCi/kg				E903.0	08/07/08 10:33 / dm
Thorium 230	-1.2E-05	uCi/kg	U	2.5E-05		E907.0	08/08/08 00:16 / dmf
Thorium 230 precision (±)	6.9E-05	uCi/kg				E907.0	08/08/08 00:16 / dmf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

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LABORATORY ANALYTICAL REPORT

Client:	Jones and Stokes	**Report Date:**	08/22/08
Project:	Dewey Burdock 00996.07	**Collection Date:**	07/10/08
Lab ID:	C08070647-009	**DateReceived:**	07/15/08
Client Sample ID:	BVC04-PLK	**Matrix:**	Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	0.019	mg/kg-dry		0.0050		SW6020	07/27/08 06:40 / sml
Uranium, Activity	1.3E-05	uCi/kg		3.4E-06		SW6020	07/27/08 06:40 / sml
RADIONUCLIDES - TOTAL							
Polonium 210	8.5E-05	uCi/kg	U	1.2E-04		RMO-3008	07/31/08 14:15 / plj
Polonium 210 precision (±)	1.3E-04	uCi/kg				RMO-3008	07/31/08 14:15 / plj
Lead 210	3.2E-03	uCi/kg	U			E909.0M	07/28/08 11:15 / dm
Lead 210 precision (±)	4.7E-03	uCi/kg				E909.0M	07/28/08 11:15 / dm
Lead 210 MDC	7.8E-03	uCi/kg				E909.0M	07/28/08 11:15 / dm
Radium 226	-2.1E-04	uCi/kg	U			E903.0	08/07/08 10:34 / dm
Radium 226 precision (±)	1.1E-04	uCi/kg				E903.0	08/07/08 10:34 / dm
Radium 226 MDC	2.8E-04	uCi/kg				E903.0	08/07/08 10:34 / dm
Thorium 230	9.4E-05	uCi/kg		2.4E-05		E907.0	08/08/08 00:16 / dmf
Thorium 230 precision (±)	9.1E-05	uCi/kg				E907.0	08/08/08 00:16 / dmf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey Burdock 00996.07
Lab ID: C08070647-010
Client Sample ID: BVC04-Carp (Cap)

Report Date: 08/22/08
Collection Date: 07/10/08
DateReceived: 07/15/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	0.014	mg/kg-dry		0.0050		SW6020	07/27/08 06:44 / sml
Uranium, Activity	9.4E-06	uCi/kg		3.4E-06		SW6020	07/27/08 06:44 / sml
RADIONUCLIDES - TOTAL							
Polonium 210	1.5E-04	uCi/kg		4.0E-06		RMO-3008	07/31/08 14:15 / plj
Polonium 210 precision (±)	7.1E-05	uCi/kg				RMO-3008	07/31/08 14:15 / plj
Lead 210	9.2E-05	uCi/kg	U			E909.0M	07/28/08 11:15 / dm
Lead 210 precision (±)	1.5E-04	uCi/kg				E909.0M	07/28/08 11:15 / dm
Lead 210 MDC	2.6E-04	uCi/kg				E909.0M	07/28/08 11:15 / dm
Radium 226	-4.8E-06	uCi/kg	U			E903.0	08/07/08 10:34 / dm
Radium 226 precision (±)	4.2E-06	uCi/kg				E903.0	08/07/08 10:34 / dm
Radium 226 MDC	9.1E-06	uCi/kg				E903.0	08/07/08 10:34 / dm
Thorium 230	2.3E-06	uCi/kg		8.0E-07		E907.0	08/08/08 00:16 / dmf
Thorium 230 precision (±)	3.7E-06	uCi/kg				E907.0	08/08/08 00:16 / dmf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey Burdock 00996.07
Lab ID: C08070647-011
Client Sample ID: CHR04-WSM

Report Date: 08/22/08
Collection Date: 07/09/08
DateReceived: 07/15/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	0.040	mg/kg-dry		0.0050		SW6020	07/27/08 07:00 / sml
Uranium, Activity	2.7E-05	uCi/kg		3.4E-06		SW6020	07/27/08 07:00 / sml
RADIONUCLIDES - TOTAL							
Polonium 210	4.9E-04	uCi/kg		1.4E-04		RMO-3008	07/31/08 14:15 / plj
Polonium 210 precision (±)	3.2E-04	uCi/kg				RMO-3008	07/31/08 14:15 / plj
Lead 210	4.5E-03	uCi/kg	U			E909.0M	07/28/08 11:15 / dm
Lead 210 precision (±)	5.3E-03	uCi/kg				E909.0M	07/28/08 11:15 / dm
Lead 210 MDC	8.8E-03	uCi/kg				E909.0M	07/28/08 11:15 / dm
Radium 226	-2.8E-04	uCi/kg	U			E903.0	08/07/08 10:34 / dm
Radium 226 precision (±)	1.5E-04	uCi/kg				E903.0	08/07/08 10:34 / dm
Radium 226 MDC	3.8E-04	uCi/kg				E903.0	08/07/08 10:34 / dm
Thorium 230	1.4E-04	uCi/kg		2.7E-05		E907.0	08/08/08 00:16 / dmf
Thorium 230 precision (±)	1.1E-04	uCi/kg				E907.0	08/08/08 00:16 / dmf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey Burdock 00996.07
Lab ID: C08070647-012
Client Sample ID: CHR04-FHM

Report Date: 08/22/08
Collection Date: 07/09/08
DateReceived: 07/15/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	0.024	mg/kg-dry		0.0050		SW6020	07/27/08 07:04 / sml
Uranium, Activity	1.6E-05	uCi/kg		3.4E-06		SW6020	07/27/08 07:04 / sml
RADIONUCLIDES - TOTAL							
Polonium 210	4.2E-04	uCi/kg		1.1E-04		RMO-3008	07/31/08 14:15 / plj
Polonium 210 precision (±)	2.8E-04	uCi/kg				RMO-3008	07/31/08 14:15 / plj
Lead 210	1.5E-03	uCi/kg	U			E909.0M	07/28/08 11:15 / dm
Lead 210 precision (±)	4.3E-03	uCi/kg				E909.0M	07/28/08 11:15 / dm
Lead 210 MDC	7.2E-03	uCi/kg				E909.0M	07/28/08 11:15 / dm
Radium 226	-2.1E-04	uCi/kg	U			E903.0	08/07/08 10:34 / dm
Radium 226 precision (±)	1.3E-04	uCi/kg				E903.0	08/07/08 10:34 / dm
Radium 226 MDC	3.0E-04	uCi/kg				E903.0	08/07/08 10:34 / dm
Thorium 230	1.3E-05	uCi/kg	U	2.2E-05		E907.0	08/08/08 00:16 / dmf
Thorium 230 precision (±)	4.5E-05	uCi/kg				E907.0	08/08/08 00:16 / dmf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

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LABORATORY ANALYTICAL REPORT

Client:	Jones and Stokes	**Report Date:**	08/22/08
Project:	Dewey Burdock 00996.07	**Collection Date:**	07/09/08
Lab ID:	C08070647-013	**DateReceived:**	07/15/08
Client Sample ID:	CHR04-PLK	**Matrix:**	Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	0.017	mg/kg-dry		0.0050		SW6020	07/27/08 07:09 / sml
Uranium, Activity	1.2E-05	uCi/kg		3.4E-06		SW6020	07/27/08 07:09 / sml
RADIONUCLIDES - TOTAL							
Polonium 210	4.7E-04	uCi/kg		1.7E-04		RMO-3008	07/31/08 14:15 / plj
Polonium 210 precision (±)	3.5E-04	uCi/kg				RMO-3008	07/31/08 14:15 / plj
Lead 210	-1.8E-03	uCi/kg	U			E909.0M	07/28/08 11:15 / dm
Lead 210 precision (±)	6.5E-03	uCi/kg				E909.0M	07/28/08 11:15 / dm
Lead 210 MDC	1.1E-02	uCi/kg				E909.0M	07/28/08 11:15 / dm
Radium 226	-2.2E-04	uCi/kg	U			E903.0	08/07/08 10:34 / dm
Radium 226 precision (±)	1.9E-04	uCi/kg				E903.0	08/07/08 10:34 / dm
Radium 226 MDC	4.1E-04	uCi/kg				E903.0	08/07/08 10:34 / dm
Thorium 230	1.6E-05	uCi/kg	U	3.4E-05		E907.0	08/08/08 00:16 / dmf
Thorium 230 precision (±)	8.9E-05	uCi/kg				E907.0	08/08/08 00:16 / dmf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

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LABORATORY ANALYTICAL REPORT

Client:	Jones and Stokes	**Report Date:**	08/22/08
Project:	Dewey Burdock 00996.07	**Collection Date:**	07/09/08
Lab ID:	C08070647-014	**DateReceived:**	07/15/08
Client Sample ID:	CHR04-SRS	**Matrix:**	Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	0.0066	mg/kg-dry		0.0050		SW6020	07/27/08 07:13 / sml
Uranium, Activity	4.4E-06	*uCi/kg*		3.4E-06		SW6020	07/27/08 07:13 / sml
RADIONUCLIDES - TOTAL							
Polonium 210	5.0E-04	uCi/kg		1.3E-05		RMO-3008	07/31/08 14:15 / plj
Polonium 210 precision (±)	1.3E-04	uCi/kg				RMO-3008	07/31/08 14:15 / plj
Lead 210	2.3E-04	uCi/kg	U			E909.0M	07/28/08 11:15 / dm
Lead 210 precision (±)	4.9E-04	uCi/kg				E909.0M	07/28/08 11:15 / dm
Lead 210 MDC	8.1E-04	uCi/kg				E909.0M	07/28/08 11:15 / dm
Radium 226	-8.7E-06	uCi/kg	U			E903.0	08/07/08 10:34 / dm
Radium 226 precision (±)	1.8E-05	uCi/kg				E903.0	08/07/08 10:34 / dm
Radium 226 MDC	3.4E-05	uCi/kg				E903.0	08/07/08 10:34 / dm
Thorium 230	3.2E-06	uCi/kg		2.5E-06		E907.0	08/08/08 00:16 / dmf
Thorium 230 precision (±)	5.3E-06	uCi/kg				E907.0	08/08/08 00:16 / dmf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey Burdock 00996.07
Lab ID: C08070647-015
Client Sample ID: CHR04-Carp

Report Date: 08/22/08
Collection Date: 07/09/08
DateReceived: 07/15/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	0.010	mg/kg-dry		0.0050		SW6020	07/27/08 07:17 / sml
Uranium, Activity	6.9E-06	uCi/kg		3.4E-06		SW6020	07/27/08 07:17 / sml
RADIONUCLIDES - TOTAL							
Polonium 210	7.4E-04	uCi/kg		3.1E-05		RMO-3008	07/31/08 14:15 / plj
Polonium 210 precision (±)	2.2E-04	uCi/kg				RMO-3008	07/31/08 14:15 / plj
Lead 210	1.5E-04	uCi/kg	U			E909.0M	07/28/08 11:15 / dm
Lead 210 precision (±)	1.2E-03	uCi/kg				E909.0M	07/28/08 11:15 / dm
Lead 210 MDC	2.0E-03	uCi/kg				E909.0M	07/28/08 11:15 / dm
Radium 226	-6.4E-05	uCi/kg	U			E903.0	08/07/08 10:34 / dm
Radium 226 precision (±)	4.4E-05	uCi/kg				E903.0	08/07/08 10:34 / dm
Radium 226 MDC	1.0E-04	uCi/kg				E903.0	08/07/08 10:34 / dm
Thorium 230	1.7E-05	uCi/kg		6.1E-06		E907.0	08/08/08 11:00 / dmf
Thorium 230 precision (±)	2.7E-05	uCi/kg				E907.0	08/08/08 11:00 / dmf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey Burdock 00996.07
Lab ID: C08070647-016
Client Sample ID: CHR04-CHC

Report Date: 08/22/08
Collection Date: 07/09/08
DateReceived: 07/15/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	0.017	mg/kg-dry		0.0050		SW6020	07/27/08 07:21 / sml
Uranium, Activity	1.2E-05	uCi/kg		3.4E-06		SW6020	07/27/08 07:21 / sml
RADIONUCLIDES - TOTAL							
Polonium 210	1.6E-04	uCi/kg		3.5E-06		RMO-3008	07/31/08 14:15 / plj
Polonium 210 precision (±)	5.2E-05	uCi/kg				RMO-3008	07/31/08 14:15 / plj
Lead 210	3.2E-05	uCi/kg	U			E909.0M	07/28/08 11:15 / dm
Lead 210 precision (±)	1.4E-04	uCi/kg				E909.0M	07/28/08 11:15 / dm
Lead 210 MDC	2.3E-04	uCi/kg				E909.0M	07/28/08 11:15 / dm
Radium 226	-1.6E-06	uCi/kg	U			E903.0	08/07/08 10:34 / dm
Radium 226 precision (±)	4.4E-06	uCi/kg				E903.0	08/07/08 10:34 / dm
Radium 226 MDC	8.4E-06	uCi/kg				E903.0	08/07/08 10:34 / dm
Thorium 230	9.0E-06	uCi/kg		7.0E-07		E907.0	08/08/08 11:00 / dmf
Thorium 230 precision (±)	2.6E-05	uCi/kg				E907.0	08/08/08 11:00 / dmf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

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LABORATORY ANALYTICAL REPORT

Client: Jones and Stokes
Project: Dewey Burdock 00996.07
Lab ID: C08070647-017
Client Sample ID: CHR04-RCS

Report Date: 08/22/08
Collection Date: 07/09/08
DateReceived: 07/15/08
Matrix: Fish

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS - TOTAL							
Uranium	0.031	mg/kg-dry		0.0050		SW6020	07/27/08 07:25 / sml
Uranium, Activity	2.1E-05	uCi/kg		3.4E-06		SW6020	07/27/08 07:25 / sml
RADIONUCLIDES - TOTAL							
Polonium 210	6.6E-07	uCi/kg	U	2.7E-06		RMO-3008	07/31/08 14:15 / plj
Polonium 210 precision (±)	3.2E-06	uCi/kg				RMO-3008	07/31/08 14:15 / plj
Lead 210	1.1E-05	uCi/kg	U			E909.0M	07/28/08 11:15 / dm
Lead 210 precision (±)	1.0E-04	uCi/kg				E909.0M	07/28/08 11:15 / dm
Lead 210 MDC	1.7E-04	uCi/kg				E909.0M	07/28/08 11:15 / dm
Radium 226	8.0E-06	uCi/kg				E903.0	08/07/08 10:34 / dm
Radium 226 precision (±)	5.4E-06	uCi/kg				E903.0	08/07/08 10:34 / dm
Radium 226 MDC	7.3E-06	uCi/kg				E903.0	08/07/08 10:34 / dm
Thorium 230	-1.3E-05	uCi/kg	U	5.3E-07		E907.0	08/08/08 11:00 / dmf
Thorium 230 precision (±)	2.3E-05	uCi/kg				E907.0	08/08/08 11:00 / dmf
FIELD PARAMETERS							
Total Mass	4160	g				FIELD	07/22/08 17:12 / ***

*** Performed by Sampler

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

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QA/QC Summary Report

Client: Jones and Stokes
Project: Dewey Burdock 00996.07

Report Date: 08/22/08
Work Order: C08070647

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0									Batch: 19208
Sample ID: C08070647-008AMS	Sample Matrix Spike				Run: BERTHOLD 770_080731C				08/07/08 10:33
Radium 226	23	pCi/g-dry		117	70	130			
Sample ID: C08070647-008AMSD	Sample Matrix Spike Duplicate				Run: BERTHOLD 770_080731C				08/07/08 10:34
Radium 226	20	pCi/g-dry		103	70	130	13	25.9	
Sample ID: MB-19208	Method Blank				Run: BERTHOLD 770_080731C				08/07/08 16:17
Radium 226	-0.002	pCi/g-dry							U
Sample ID: LCS-19208	Laboratory Control Sample				Run: BERTHOLD 770_080731C				08/07/08 16:17
Radium 226	0.077	pCi/g-dry		102	70	130			
Method: E907.0									Batch: 19208
Sample ID: C08070647-013AMS	Sample Matrix Spike				Run: EGG-ORTEC_080731C				08/11/08 09:23
Thorium 230	15.1	pCi/g-dry	0.10	90	70	130			
Sample ID: C08070647-013AMSD	Sample Matrix Spike Duplicate				Run: EGG-ORTEC_080731C				08/11/08 09:41
Thorium 230	18.0	pCi/g-dry	0.10	108	70	130	17	30	
Sample ID: LCS-19208	Laboratory Control Sample				Run: EGG-ORTEC_080731C				08/08/08 11:00
Thorium 230	0.0398	pCi/g-dry	0.10	90	70	130			
Sample ID: MB-19208	Method Blank				Run: EGG-ORTEC_080731C				08/08/08 11:00
Thorium 230	-0.0003	pCi/g-dry							U
Method: E909.0M									Batch: 19208
Sample ID: C08070647-006AMS	Sample Matrix Spike				Run: PACKARD 3100TR_080728D				07/28/08 11:15
Lead 210	150	pCi/g-dry		111	70	130			
Sample ID: C08070647-006AMSD	Sample Matrix Spike Duplicate				Run: PACKARD 3100TR_080728D				07/28/08 11:15
Lead 210	197	pCi/g-dry		146	70	130	27	30	S
- Spike response is outside of the acceptance range for this analysis. Since the LCS and the RPD for the MS MSD pair are acceptable, the response is considered to be matrix related. The batch is approved.									
Sample ID: MB-R106080	Method Blank				Run: PACKARD 3100TR_080728D				07/28/08 11:15
Lead 210	0.0001	pCi/g-dry							U
Sample ID: LCS-R106080	Laboratory Control Sample				Run: PACKARD 3100TR_080728D				07/28/08 11:15
Lead 210	0.103	pCi/g-dry		88	70	130			

Qualifiers:

RL - Analyte reporting limit.
S - Spike recovery outside of advisory limits.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

ENERGY LABORATORIES, INC. • 2393 Salt Creek Highway (82601) • P.O. Box 3258 • Casper, WY 82602
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QA/QC Summary Report

Client: Jones and Stokes
Project: Dewey Burdock 00996.07

Report Date: 08/22/08
Work Order: C08070647

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: RMO-3008									Batch: 19208
Sample ID: C08070647-017AMS	Sample Matrix Spike				Run: EGG-ORTEC_080731B				07/31/08 14:15
Polonium 210	0.371	pCi/g-dry	0.10	161	70	130			S
- Spike response is outside of the acceptance range for this analysis. Since the MB, LCS and the MSD are acceptable the batch is approved.									
Sample ID: C08070647-017AMSD	Sample Matrix Spike Duplicate				Run: EGG-ORTEC_080731B				07/31/08 14:15
Polonium 210	0.229	pCi/g-dry	0.10	100	70	130	47	30	R
Sample ID: LCS-R105592	Laboratory Control Sample				Run: EGG-ORTEC_080731B				07/31/08 14:15
Polonium 210	0.0918	pCi/g-dry	0.10	106	70	130			
Sample ID: MB-R105592	Method Blank				Run: EGG-ORTEC_080731B				07/31/08 14:15
Polonium 210	7E-05	pCi/g-dry							U
Method: SW6020									Batch: 19208
Sample ID: MB-19208	Method Blank				Run: ICPMS4-C_080726A				07/27/08 05:43
Uranium	9E-06	mg/kg-dry	2E-06						
Sample ID: LCS1-19208	Laboratory Control Sample				Run: ICPMS4-C_080726A				07/27/08 05:47
Uranium	0.0485	mg/kg-dry	0.015	97	75	125			
Sample ID: C08070647-017AMS	Sample Matrix Spike				Run: ICPMS4-C_080726A				07/27/08 07:29
Uranium	1.41	mg/kg-dry	0.015	121	75	125			
Sample ID: C08070647-017AMSD	Sample Matrix Spike Duplicate				Run: ICPMS4-C_080726A				07/27/08 07:33
Uranium	1.41	mg/kg-dry	0.015	120	75	125	0.6	20	

Qualifiers:

RL - Analyte reporting limit.
R - RPD exceeds advisory limit.
U - Not detected at minimum detectable concentration

ND - Not detected at the reporting limit.
S - Spike recovery outside of advisory limits.

APPENDIX 3.5-J

COMPILED HABITAT DATA FORMS

SAMPLE COLLECTION FORM - STREAMS

Site ID	BVC01	Date	4/15/2008

Water Chemistry

Sample ID	Transect	Comments
		NA - Sampled by Respec

Reach-wide Benthos Sample

Sample ID	No. of Jars	Comment
BVC01HF	1	High flow sampling. Composit sample from 11 transects. Midge hatch in progress.

Transect		A		B		C		D		E		F		G		H		I		J		K	
Substrate	Channel	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan
Fine/Sand	Pool		P	F	P							F	P	F	P							F	P
Gravel	Glide								G		G										G		
Coarse	Riffle	C				C	R	C		C						C	R	C	R	C			
other	Run																						

Transect		A	B	C	D	E	F	G	H	I	J	K
Sample Location	Left											
	Right											
	Center											

Substrate Size Classes
Fine/Sand - ladybug or smaller (<2mm)
Gravel - ladybug to tennis ball (2 to 64mm)
Coarse - tennis ball to car sized (64 to 4000mm)
Other - bedrock, hardpan, wood etc

SAMPLE COLLECTION FORM - STREAMS

Site ID	BVC04	Date	4/14/2008

Water Chemistry

Sample ID	Transect	Comments
		NA - Sampled by Respec

Reach-wide Benthos Sample

Sample ID	No. of Jars	Comment
BVC04HF	2	Spring sampling. Composit sample from 11 transects. Midge hatch in progress.

Transect		A		B		C		D		E		F		G		H		I		J		K	
Substrate	Channel	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan
Fine/Sand	Pool							F	P	F	P	F	P	F	P			F	P	F	P	F	P
Gravel	Glide	G		G		G																	
Coarse	Riffle		R		R		R									C	R						
other	Run																						

Transect		A	B	C	D	E	F	G	H	I	J	K
Sample Location	Left											
	Right											
	Center											

Substrate Size Classes
Fine/Sand - ladybug or smaller (<2mm)
Gravel - ladybug to tennis ball (2 to 64mm)
Coarse - tennis ball to car sized (64 to 4000mm)
Other - bedrock, hardpan, wood etc

On Site Description Data

Section A

Project Site ID: BVC01	T 7S , R 1E , SW 1/4 of Sec 9		Date: 14 APR 2008
Stream Name: Beaver Creek			Time: 14:51
Transect 1 (Downstream)		**Transect 11 (Upstream)**	
GPS Coordinates (utm):	Northing: 43°26' 57.11"	Easting: 104°00' 56.12"	Northing: 43°26' 57.00"	Easting: 104°00' 48.26"
Investigators: C. Foreman, G. McKee (Sections A, B, C), A. Wones, K. Shook, E. Krantz (Sections D, E, F, G, H, I, J)			

Section B

Preliminary Mean Stream Width (PMSW)

	Width Number											
	1	2	3	4	5	6	7	8	9	10	Sum	Avg. PMSW
Width (0.1m)	6.7	6.9	7.7	8.8	5.9	11.3	8.2	5.0	5.9	7.1	73.5	7.35

Transect Spacing* 22 m

*If PMSW <10m space transects every 3 PMSW. If >10m, transects are spaced every 2 PMSW.

Total Reach Length: 220 m

Reach Length = 11 Transects, 10 distances apart X 3 PMSW = 30 PMSW or 20 PMSW if width >10m.

Section C

Water Quality

Reading	Time (2400)	Water Temperature (°C)	Air Temperature (oC)	Turbidity (NTU)	Secchi (cm)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	Conductivity (µS/cm)
Morning								
Afternoon	14:55	16.0	16.9	14.3	-	12.21	7,186	

Visual Observations

1) Odor (~~Yes~~ / No) **2) Septic (~~Yes~~ / No)** **3) Deadfish (~~Yes~~ / No)** **4) Surface Film (~~Yes~~ / No)**

5) Color: Clear **6) Ice Cover (~~Yes~~ / No)**

Weather Conditions:	Current	Past 24 hrs
Clear/sunny	✓	✓
Partly cloudy	☐	☐
Intermittent showers	☐	☐
Steady rain	☐	☐
Heavy rain	☐	☐

Field Comments: Heavy silt deposition in pools. WQ by Respec. pH = 8.27

Section D

Habitats Available number of each (also place on map Section E)

Pool 3 Run/Glide 2 Riffle 3 Other (describe) see Table 1

Lengths of Riffle(s): 10.7, 10.7, 6.7, _____, _____.

Nearest Transect # : 3, 9, 11, _____, _____.

Total Length (riffles) = 28.0

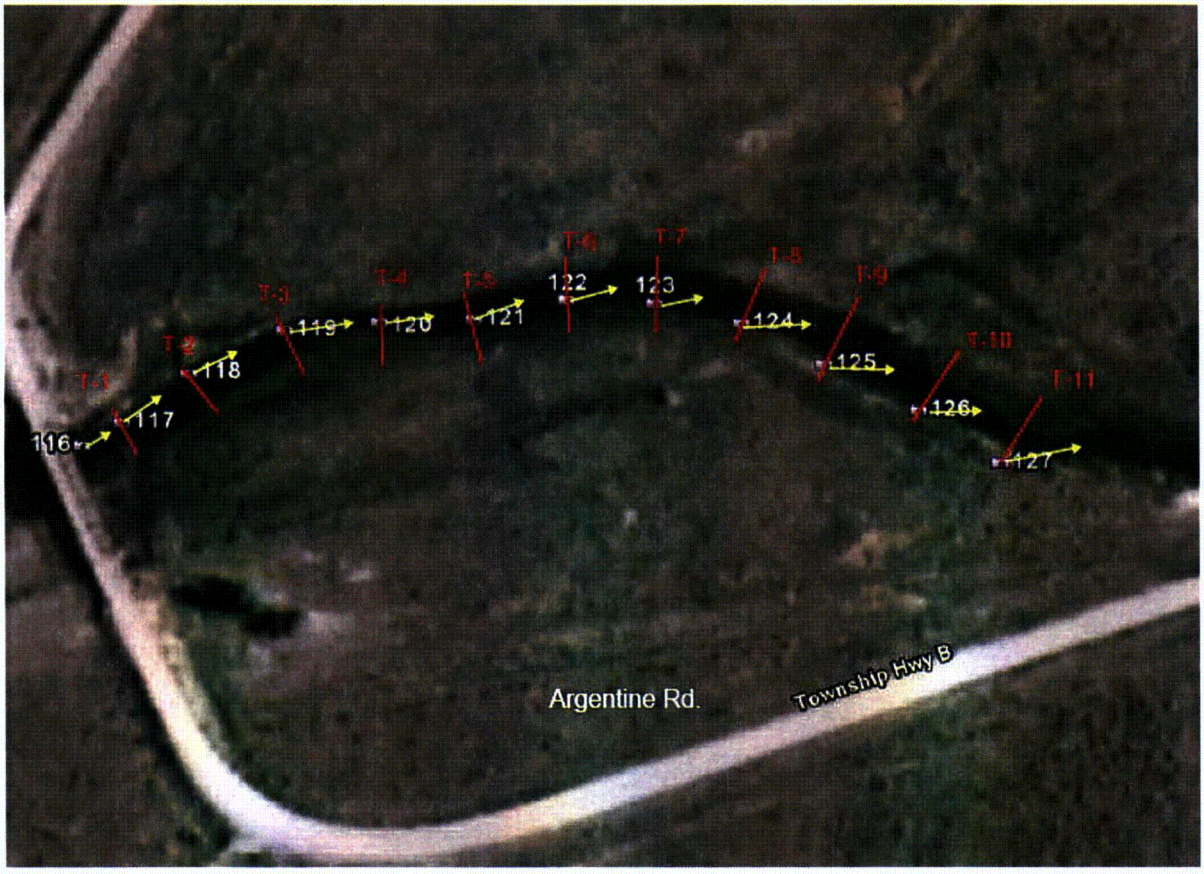
Pool Forming Elements See Table 1= LS, F

Map, Slope Measurements, and Photo-documentation Data

Project Site ID: BVC01	**Stream Name: Beaver Creek**	Date: 16 APR 2008

Section E cont.

Draw a map of the site with location of most upstream and most downstream transects. Include locations of photographic points, direction of photograph, and frame number.



Approximately 240 m.

Bed Substrate Composition

Project Site ID:BVC01	Stream Name: Beaver Creek	Date: 17 APR 2008

Section F

Organic Substrates

	Description	Tally	Number
Detritus	sticks, wood, coarse plant material (CPOM)		2
Muck-Mud	black, very fine organic (FPOM)		

Inorganic Substrates

	Diameter	Tally	Number
Clay	<0.004 (slick)		1
Silt	0.004-0.062		15
Sand	0.062-2 (gritty)		
Very Fine Gravel	>2-4		
Fine Gravel	>4-8		
Medium Gravel	>8-16		1
Coarse Gravel	>16-32		7
Very Coarse Gravel	>32-64		17
Cobble	>64-128		9
Large Cobble	>128-256		3
Boulder	>256-512		
Large Boulder	>512		
		Total Number:	55

Section G

Large Woody Debris Data

1

Project Site ID: BVC01 Stream Name: Beaver Creek m/d/yr: 04/17/2008 Page 1 of 1

Transect Spacing	Log Jam Number	LWD Number	Zone	Meander Location	Habitat Association	Angle	Length	Diameter
1-2	0	0						
2-3	0	0						
3-4	0	0						
4-5	0	0						
5-6	0	0						
6-7	0	0						
7-8	0	0						
8-9	0	0						
9-10	0	0						
10-11	0	0						

Zone: Zone 1 is water surface at baseflow, Zone 2 is between baseflow surface and bankfull flow surface, Zone 3 is bankfull channel width above bankfull flow surface.

Meander Location: IM=inside meander, OM=outside meander, CO=crossover, SS=straight section

Habitat Association: PL=pool, RF=riffle, RN=run

LARGE WOODY DEBRIS CATEGORIES (≥10 cm small end diameter; ≥1.5 m length)				
Categories	1	2	3	4
Diameter Large End	0.1-<0.3m	0.3-0.6m	0.6-0.8m	>0.8m
Length	>1.5-5m	5-15m	>15m	-

Stream Shade and Canopy Cover Monitoring

Project Site ID:BVC01	Stream Name: Beaver Creek	Date: 17 APR 2008

Section H

Site Name:BVC04							Date: 4/17/2008
Reach Length:				Transect Interval:			Initials:
Transect	Left Bank	Center Upstream	Center Right	Center-downstream	Center Left	Right Bank	Comments:
1	0	0	0	0	0	0	
2	0	0	0	0	0	7	RB = bank
3	0	0	0	0	0	6	RB = bank
4	7	0	0	0	0	5	LB = grass/bank RB = bank
5	9	0	0	0	0	13	LB = grass/bank RB = grass/bank
6	3	0	0	0	0	4	LB = grass RB = grass
7	16	0	0	0	0	3	LB = grass RB = grass
8	4	0	0	0	0	0	LB = grass
9	2	0	0	0	0	0	LB = Bank
10	3	0	0	0	0	0	LB = Grass
11	0	0	0	0	0	0	

Transect Data

Project Site ID: BVC01	Stream Name: Beaver Creek	Transect Number
Date: 4/15/08		1 of 11
Habitat Type Along Transect (circle one):	[pool] riffle run	

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	A	A
Bank Height (0.1 m)	1.3	1.3
Bank Angle (degrees)	25	21
Streambank length (0.1 m)	8.6	2.7
Length of Streambank Vegetated (0.1 m)	8.6	2.7
Length of Streambank Eroded (0.1 m)	0	0
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / low / moderate / [high]	none / low / moderate / [high]
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout / young/sapling / mature / decadent / dead / [none]	seedling/sprout / young/sapling / mature / decadent / dead / [none]
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	0	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0.3			
LBF	1.5	0.0		
LEW	3.0	0.4	0.00	
LCB	3.5	0.5	0.09	
STR (@1/4)	4.9	0.5	0.12	
STR (@1/2)	6.1	0.4	0.03	
STR (@3/4)	7.5	0.5	0.09	
RCB	8.8	0.4	0.03	
REW	9.4	0.4	0.00	
RBF	11.8	0.0		
RTB	13.7			

Location Codes:

LTB left top bank

RTB right top bank
LBF left bankfull
RBF right bankfull

LCB left channel bottom
RCB right channel bottom
LEW left edge water

REW right edge water
STR stream

Bank top width (RTB-LTB) = 13.4

Bankfull width (RBF-LBF)= 10.2

Channel Bottom Width (RCB-LCB)= 5.4

Stream Width (REW-LEW)= 6.3

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC01	Stream Name: Beaver Creek	Transect Number
Date: 4/15/08		2 of 11
Habitat Type Along Transect (circle one):	[pool] riffle run	

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	A	P
Bank Height (0.1 m)	1.7	1.8
Bank Angle (degrees)	15	41
Streambank length (0.1 m)	8.6	2.7
Length of Streambank Vegetated (0.1 m)	8.6	2.7
Length of Streambank Eroded (0.1 m)	0	0
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / low / [moderate] / high	none / low / [moderate] / high
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout / young/sapling / mature / decadent / dead / [not present]	seedling/sprout / young/sapling / mature / decadent / dead / [not present]
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	0	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0.3			
LBF	6.9	0.0		
LEW	8.1	0.3	0.00	
LCB	10.4	0.6	0.30	
STR (@1/4)	9.6	0.4	0.09	
STR (@1/2)	11.8	0.8	0.52	
STR (@3/4)	13.3	0.7	0.43	
RCB	13.9	0.6	0.37	
REW	14.6	0.3	0.00	
RBF	15.0	0.0		
RTB	15.9			

Location Codes:

LTB left top bank

RTB right top bank
LBF left bankfull
RBF right bankfull

LCB left channel bottom
RCB right channel bottom
LEW left edge water

REW right edge water
STR stream

Bank top width (RTB-LTB) = 15.5

Bankfull width (RBF-LBF)= 8.1

Channel Bottom Width (RCB-LCB)= 3.5

Stream Width (REW-LEW)= 6.5

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC01	Stream Name: Beaver Creek	Transect Number
Date: 4/15/08		3 of 11
Habitat Type Along Transect (circle one): pool riffle [run]		

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	A	P
Bank Height (0.1 m)	1.6	1.6
Bank Angle (degrees)	8	48
Streambank length (0.1 m)	12.0	3.3
Length of Streambank Vegetated (0.1 m)	12.0	0.5
Length of Streambank Eroded (0.1 m)	0	2.9
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0.2	0.2
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / low / [moderate] / high	none / low / [moderate] / high
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout / young/sapling / mature / decadent / dead / [none]	seedling/sprout / young/sapling / mature / [decadent] / dead / [none]
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	0	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0.3			
LBF	9.8	0.0		
LEW	11.2	0.5	0.00	
LCB	12.7	0.5	0.06	
STR (@1/4)	12.9	0.5	0.09	
STR (@1/2)	14.2	0.5	0.06	
STR (@3/4)	15.1	0.5	0.09	
RCB	15.6	0.5	0.06	
REW	16.0	0.3	0.00	
RBF	16.9	0.0		
RTB	17.7			

Location Codes:

LTB left top bank

RTB right top bank
LBF left bankfull
RBF right bankfull

LCB left channel bottom
RCB right channel bottom
LEW left edge water

REW right edge water
STR stream

Bank top width (RTB-LTB) = 17.4

Bankfull width (RBF-LBF)= 7.2

Channel Bottom Width (RCB-LCB)= 3.0

Stream Width (REW-LEW)= 4.8

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC01	Stream Name: Beaver Creek	Transect Number
Date: 4/15/08		4 of 11
Habitat Type Along Transect (circle one): pool [riffle] run		

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	A	A
Bank Height (0.1 m)	1.7	1.7
Bank Angle (degrees)	15	43
Streambank length (0.1 m)	8.1	2.6
Length of Streambank Vegetated (0.1 m)	8.1	2.6
Length of Streambank Eroded (0.1 m)	0	0
Length of Streambank Deposition (0.1 m)	0.6	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0.3	0.1
Undercut Bank (0.1 m)	0.2	0
Riparian landuse (circle one)	Cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify	cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify
Animal Vegetation Use (circle one)	none, low, [moderate], high	none, low, [moderate], high
Riparian Vegetation Type (Dominant)	sedge/rush, cottonwoods, [grass/forb], green ash, willows, silver maple, shrubs, other_____	sedge/rush, cottonwoods, [grass/forb], green ash, willows, silver maple, shrubs, other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout, young/sapling, mature, decadent, dead, [none]	seedling/sprout, young/sapling, mature, decadent, dead, [none]
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	0	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0.3			
LBF	7.9	0.0		
LEW	7.8	0.2	0.00	
LCB	8.0	0.3	0.12	
STR (@1/4)	9.6	0.3	0.06	
STR (@1/2)	11.2	0.4	0.15	
STR (@3/4)	12.9	0.4	0.15	
RCB	13.9	0.3	0.06	
REW	14.3	0.2	0.00	
RBF	14.4	0.0		
RTB	15.7			

Location Codes:

LTB left top bank

RTB right top bank
LBF left bankfull
RBF right bankfull

LCB left channel bottom
RCB right channel bottom
LEW left edge water

REW right edge water
STR stream

Bank top width (RTB-LTB) = 15.4

Bankfull width (RBF-LBF)= 6.5

Channel Bottom Width (RCB-LCB)= 5.8

Stream Width (REW-LEW)= 6.6

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC01	Stream Name: Beaver Creek	Transect Number
Date: 4/16/08, 4/17/08		5 of 11
Habitat Type Along Transect (circle one):	pool riffle run	

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	P	P
Bank Height (0.1 m)	1.6	1.5
Bank Angle (degrees)	23	45
Streambank length (0.1 m)	4.0	4.0
Length of Streambank Vegetated (0.1 m)	3.9	3.2
Length of Streambank Eroded (0.1 m)	0.1	0.8
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / [low] / moderate / high	none / [low] / moderate / high
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout / young/sapling / mature / decadent / dead / [none]	seedling/sprout / young/sapling / mature / decadent / dead / [none]
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	0	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0.0			
LBF	3.7	0.0		
LEW	3.7	0.4	0.07	
LCB	4.7	0.7	0.21	
STR (@1/4)	5.8	0.6	0.29	
STR (@1/2)	7.3	0.6	0.31	
STR (@3/4)	9.5	0.6	0.25	
RCB	10.9	0.6	0.21	
REW	11.3	0.5	0.12	
RBF	11.7	0.1		
RTB	12.9			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) = 12.9

Bankfull width (RBF-LBF)= 8.0

Channel Bottom Width (RCB-LCB)= 6.2

Stream Width (REW-LEW)= 7.6

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC01	Stream Name: Beaver Creek	Transect Number 6 of 11
Date: 4/16/08, 4/17/08		
Habitat Type Along Transect (circle one):	[pool] riffle run	

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	P	P
Bank Height (0.1 m)	1.8	1.5
Bank Angle (degrees)	25	55
Streambank length (0.1 m)	3.0	2.2
Length of Streambank Vegetated (0.1 m)	3.0	
Length of Streambank Eroded (0.1 m)	0	
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify	cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify
Animal Vegetation Use (circle one)	none, [low], moderate, high	none, [low], moderate, high
Riparian Vegetation Type (Dominant)	sedge/rush, cottonwoods, [grass/forb], green ash, willows, silver maple, shrubs, other_____	sedge/rush, cottonwoods, [grass/forb], green ash, willows, silver maple, shrubs, other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout, young/sapling, mature, decadent, dead, [none]	seedling/sprout, young/sapling, mature, [decadent], dead
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	0	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0.5			
LBF	4.1	0.0		
LEW	4.7	0.9*	0.30	
LCB	4.7	0.9	0.30	
STR (@1/4)	6.4	0.9	0.42	
STR (@1/2)	8.5	1.0	0.64	
STR (@3/4)	10.5	0.9	0.59	
RCB	11.5	0.7	0.31	
REW	11.8	0.5*	0.14	
RBF	12.2	0.0		
RTB	13.1			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) = 12.6

Bankfull width (RBF-LBF)= 8.1

Channel Bottom Width (RCB-LCB)= 6.9

Stream Width (REW-LEW)= 7.2

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC01	Stream Name: Beaver Creek	Transect Number 7 of 11
Date: 4/16/08, 4/17/08		
Habitat Type Along Transect (circle one):	[pool] riffle run	

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	P	P
Bank Height (0.1 m)	1.6	1.8
Bank Angle (degrees)	23	50
Streambank length (0.1 m)	3.0	2.2
Length of Streambank Vegetated (0.1 m)	2.9	1.5
Length of Streambank Eroded (0.1 m)	0.1	0.7
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0.2	0.2
Undercut Bank (0.1 m)	0	0.25
Riparian landuse (circle one)	Cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify	cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify
Animal Vegetation Use (circle one)	none, low, [moderate], high	none, low, [moderate], high
Riparian Vegetation Type (Dominant)	sedge/rush, cottonwoods, [grass/forb], green ash, willows, silver maple, shrubs, other_____	sedge/rush, cottonwoods, [grass/forb], green ash, willows, silver maple, shrubs, other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout, young/sapling, mature, decadent, dead, [none]	seedling/sprout, [young/sapling], mature, decadent, dead, [none]
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	0	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0.5			
LBF	4.1	0.0		
LEW	4.7	0.7	0.21	
LCB	4.7	0.7	0.21	
STR (@1/4)	6.4	1.0	0.50	
STR (@1/2)	8.4	1.0	0.51	
STR (@3/4)	10.1	0.9	0.40	
RCB	12.0	0.9	0.39	
REW	12.5	0.7	0.16	
RBF	13.2	0.0		
RTB	14.0			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) = 13.5

Bankfull width (RBF-LBF)= 9.1

Channel Bottom Width (RCB-LCB)= 7.3

Stream Width (REW-LEW)= 7.8

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC01	Stream Name: Beaver Creek	Transect Number
Date: 4/16/08, 4/17/08		8 of 11
Habitat Type Along Transect (circle one): pool [riffle] run		

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	P	P
Bank Height (0.1 m)	1.5	1.5
Bank Angle (degrees)	23	41
Streambank length (0.1 m)	3.0	3.0
Length of Streambank Vegetated (0.1 m)	3.0	1.8
Length of Streambank Eroded (0.1 m)	0	1.2
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0.2	0
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / low / [moderate] / high	none / low / [moderate] / high
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____	sedge/rush / cottonwoods / grass/forb / [shrubs] / green ash / willows / silver maple / other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout / young/sapling / mature / decadent / dead / [none]	seedling/sprout / young/sapling / mature / decadent / dead / [none]
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	0	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0.5			
LBF	3.4	0.0		
LEW	4.0	0.6	0.10	
LCB	4.4	0.6	0.20	
STR (@1/4)	5.6	0.6	0.20	
STR (@1/2)	7.2	0.6	0.19	
STR (@3/4)	8.8	0.7	0.24	
RCB	10.1	0.7	0.20	
REW	10.6	0.5	0.00	
RBF	11.9	1.0		
RTB	12.5			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) = 12.0

Bankfull width (RBF-LBF)= 8.5

Channel Bottom Width (RCB-LCB)= 5.7

Stream Width (REW-LEW)= 6.6

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC01	Stream Name: Beaver Creek	Transect Number 9 of 11
Date: 4/16/08, 4/17/08		
Habitat Type Along Transect (circle one): pool riffle [run]		

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	P	A
Bank Height (0.1 m)	1.6	1.5
Bank Angle (degrees)	25	25
Streambank length (0.1 m)	3.3	4.8
Length of Streambank Vegetated (0.1 m)	2.9	8.8
Length of Streambank Eroded (0.1 m)	0.4	0.4
Length of Streambank Deposition (0.1 m)	0	1.0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0.7
Undercut Bank (0.1 m)	0.2	0
Riparian landuse (circle one)	Cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify	cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify
Animal Vegetation Use (circle one)	none, low, [moderate], high	none, low, [moderate], high
Riparian Vegetation Type (Dominant)	sedge/rush, cottonwoods, grass/forb, green ash, willows, silver maple, [shrubs], other_____	sedge/rush, cottonwoods, grass/forb, green ash, willows, silver maple, [shrubs], other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout, young/sapling, mature, decadent, dead, [none]	seedling/sprout, young/sapling, [mature], decadent, dead
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	0	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0.5			
LBF	3.7	0.0		
LEW	4.0	0.5	0.00	
LCB	4.7	0.5	0.18	
STR (@1/4)	5.6	0.5	0.19	
STR (@1/2)	6.9	0.5	0.19	
STR (@3/4)	8.7	0.5	0.11	
RCB	9.4	0.4	0.11	
REW	10.9	0.5	0.01	
RBF	12.5	0.0		
RTB	14.3			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) = 13.8
Bankfull width (RBF-LBF) = 8.8
Channel Bottom Width (RCB-LCB) = 4.7
Stream Width (REW-LEW) = 6.9

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC01	Stream Name: Beaver Creek	Transect Number
Date: 4/16/08, 4/17/08		10 of 11
Habitat Type Along Transect (circle one): pool riffle run		

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	P	P
Bank Height (0.1 m)	1.8	2.0
Bank Angle (degrees)	29	20
Streambank length (0.1 m)	2.8	6
Length of Streambank Vegetated (0.1 m)	2.4	5.8
Length of Streambank Eroded (0.1 m)	0.4	0.2
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0.2	0
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland / pasture/rangeland / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / pasture/rangeland / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / low / moderate / high	none / low / moderate / high
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / grass/forb / green ash / willows / silver maple / shrubs / other_____	sedge/rush / cottonwoods / grass/forb / green ash / willows / silver maple / shrubs / other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout / young/sapling / mature / decadent / dead / none	seedling/sprout / young/sapling / mature / decadent / dead / none
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	0	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0.5			
LBF	3.4	0.0		
LEW	3.6	0.4	0.02	
LCB	3.9	0.6	0.20	
STR (@1/4)	4.9	0.7	0.32	
STR (@1/2)	6.1	0.8	0.38	
STR (@3/4)	7.5	0.8	0.19	
RCB	8.0	0.8	0.14	
REW	8.5	0.7	0.00	
RBF	10.2	0.2		
RTB	14.3			

Location Codes:

LTB left top bank

RTB right top bank
LBF left bankfull
RBF right bankfull

LCB left channel bottom
RCB right channel bottom
LEW left edge water

REW right edge water
STR stream

Bank top width (RTB-LTB) = 13.8

Bankfull width (RBF-LBF)= 6.8

Channel Bottom Width (RCB-LCB)= 4.0

Stream Width (REW-LEW)= 4.9

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC01	Stream Name: Beaver Creek	Transect Number 11 of 11
Date: 4/16/08, 4/17/08		
Habitat Type Along Transect (circle one): pool [riffle] run		

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	P	A
Bank Height (0.1 m)		
Bank Angle (degrees)	35	10
Streambank length (0.1 m)	5.0	10.4
Length of Streambank Vegetated (0.1 m)	2.4	9.7
Length of Streambank Eroded (0.1 m)	2.6	0.7
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0.2	0
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / low / [moderate] / high	none / low / [moderate] / high
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout / young/sapling / mature / decadent / dead / [none]	seedling/sprout / young/sapling / mature / decadent / dead / [none]
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	0	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0.5			
LBF	1.5	0.0		
LEW	3.3	0.5	0.01	
LCB	3.5	0.7	0.13	
STR (@1/4)	4.2	0.7	0.20	
STR (@1/2)	5.1	0.7	0.18	
STR (@3/4)	5.8	0.7	0.11	
RCB	6.3	0.7	0.08	
REW	6.7	0.5	0.00	
RBF	8.8	0.2		
RTB	16.8			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) = 16.3

Bankfull width (RBF-LBF)= 7.3

Channel Bottom Width (RCB-LCB)= 2.9

Stream Width (REW-LEW)= 3.5

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

SAMPLE COLLECTION FORM - STREAMS

Site ID	BVC01	Date	7/9/2008

Water Chemistry

Sample ID	Transect	Comments
		NA

Reach-wide Benthos Sample

Sample ID	No. of Jars	Comment
BVC01	1	Low flow sampling. Composit sample from 11 transects. Appears to have low benthic abundance.

Transect		A		B		C		D		E		F		G		H		I		J		K	
Substrate	Channel	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan
Fine/Sand	Pool								P		P		P								P		P
Gravel	Glide	G	GL	G	GL			G		G		G		G		G		G		G		G	
Coarse	Riffle					C	R								R		R		R				
other	Run																						

Transect		A	B	C	D	E	F	G	H	I	J	K
Sample Location	Left	X			X			X			X	
	Right		X			X			X			X
	Center			X			X			X		

Substrate Size Classes
Fine/Sand - ladybug or smaller (<2mm)
Gravel - ladybug to tennis ball (2 to 64mm)
Coarse - tennis ball to car sized (64 to 4000mm)
Other - bedrock, hardpan, wood etc

SAMPLE COLLECTION FORM - STREAMS

Site ID	BVC04	Date	7/8/2008

Water Chemistry

Sample ID	Transect	Comments

Reach-wide Benthos Sample

Sample ID	No. of Jars	Comment
BVC04	2	Spring sampling. Composit sample from 11 transects.

Transect		A		B		C		D		E		F		G		H		I		J		K	
Substrate	Channel	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan	Sub	Chan
Fine/Sand	Pool											F				F	P	F	P	F	P		P
Gravel	Glide		GL			G	GL	G		G			GL	G									
Coarse	Riffle	C		C	R				R		R				R							C	
other	Run																						

Transect		A	B	C	D	E	F	G	H	I	J	K
Sample Location	Left	X			X			X			X	
	Right		X			X			X			X
	Center			X			X			X		

Substrate Size Classes
Fine/Sand - ladybug or smaller (<2mm)
Gravel - ladybug to tennis ball (2 to 64mm)
Coarse - tennis ball to car sized (64 to 4000mm)
Other - bedrock, hardpan, wood etc

On Site Description Data

Section A

Project Site ID: BVC01	T____, R____, ____1/4 of Sec____		Date: 09 JUL 2008
Stream Name: Beaver Creek			Time: 14:51
Transect 1 (Upstream)		Transect 11 (Downstream)	
GPS Coordinates (utm): WGS84	Northing: 4820631.96	Easting: 0571323.79	Northing: 4820515.00	Easting: 0571485.75
Investigators: C. Foreman, G. McKee (Sections A, B, C), A. Wones, K. Shook, M. Winland (Sections D, E, F, G, H, I, J)			

Section B

Preliminary Mean Stream Width (PMSW)

	Width Number											
	1	2	3	4	5	6	7	8	9	10	Sum	Avg. PMSW
Width (0.1m)	6.7	6.9	7.7	8.8	5.9	11.3	8.2	5.0	5.9	7.1	73.5	7.35

Transect Spacing *: 22 m

*If PMSW <10m space transects every 3 PMSW. If >10m, transects are spaced every 2 PMSW.

Total Reach Length: 220 m

Reach Length = 11 Transects, 10 distances apart X 3 PMSW = 30 PMSW or 20 PMSW if width >10m.

Section C

Water Quality

Reading	Time (2400)	Water Temperature (°C)	Air Temperature (oC)	Turbidity (NTU)	Secchi (cm)	Dissolved Oxygen (mg/L	Specific Conductance (µS/cm)	Conductivity (µS/cm)
Morning	0945	23.63	25.5			8.41		5,939
Afternoon								

Visual Observations

1) Odor (~~Yes~~ / No)	**2) Septic (~~Yes~~ / No)**	**3) Deadfish (~~Yes~~ / No)**	**4) Surface Film (~~Yes~~ / No)**
5) Color: Olive Drab, clear		**6) Ice Cover (~~Yes~~ / No)**	

Weather Conditions:	Current	Past 24 hrs
Clear/sunny	☐	☐
Partly cloudy	✓	✓
Intermittent showers	☐	☐
Steady rain	☐	☐
Heavy rain	☐	☐

Field Comments: wind 5-10 mph, sparse high clouds.

Section D

Habitats Available number of each (also place on map Section E)

Pool 2 Run/Glide 1 Riffle 2 Other (describe) see Table 1

Lengths of Riffle(s): 13, 57.8, 6.7, _____, _____.

Nearest Transect # : 3, 7, _____, _____, _____.

Total Length (riffles) = 70.8

Pool Forming Elements See Table 1= _____ F

Map, Slope Measurements, and Photo-documentation Data

Project Site ID: BVC01	**Stream Name: Beaver Creek**	Date: 09 JUL 2008

Section E cont.

Draw a map of the site with location of most upstream and most downstream transects. Include locations of photographic points, direction of photograph, and frame number.

N
W E
S



Approximately 320 m.

Bed Substrate Composition

Project Site ID:BVC01	Stream Name: Beaver Creek	Date: 09 JUL 2008

Section F

Organic Substrates			
	Description	Tally	Number
Detritus	sticks, wood, coarse plant material (CPOM)		2
Muck-Mud	black, very fine organic (FPOM)		6

Inorganic Substrates			
	Diameter	Tally	Number
Clay	<0.004 (slick)		1
Silt	0.004-0.062		8
Sand	0.062-2 (gritty)		1
Very Fine Gravel	>2-4		6
Fine Gravel	>4-8		2
Medium Gravel	>8-16		19
Coarse Gravel	>16-32		15
Very Coarse Gravel	>32-64		28
Cobble	>64-128		20
Large Cobble	>128-256		5
Boulder	>256-512		1
Large Boulder	>512		1
		Total Number:	105

Section G

Large Woody Debris Data

1

Project Site ID: BVC01 Stream Name: Beaver Creek m/d/yr: 07/09/2008 Page 1 of 1

Transect Spacing	Log Jam Number	LWD Number	Zone	Meander Location	Habitat Association	Angle	Length	Diameter
1-2	0	0						
2-3	0	0						
3-4	0	0						
4-5	0	0						
5-6	0	0						
6-7	0	0						
7-8	0	0						
8-9	0	0						
9-10	0	0						
10-11	0	0						

Zone: Zone 1 is water surface at baseflow, Zone 2 is between baseflow surface and bankfull flow surface, Zone 3 is bankfull channel width above bankfull flow surface.
Meander Location: IM=inside meander, OM=outside meander, CO=crossover, SS=straight section
Habitat Association: PL=pool, RF=riffle, RN=run

LARGE WOODY DEBRIS CATEGORIES (≥10 cm small end diameter; ≥1.5 m length)				
Categories	1	2	3	4
Diameter Large End	0.1-<0.3m	0.3-0.6m	0.6-0.8m	>0.8m
Length	>1.5-5m	5-15m	>15m	-

Stream Shade and Canopy Cover Monitoring

Project Site ID:BVC01	Stream Name: Beaver Creek	Date: 17 APR 2008

Section H

Site Name:BVC01							Date: 7/09/2008
Reach Length:				Transect Interval:			Initials:
Transect	Left Bank	Center Upstream	Center Right	Center-downstream	Center Left	Right Bank	Comments:
1	0	0	0	0	0	0	
2	0	0	0	0	0	4	RB = bank
3	0	0	0	0	0	7	RB = bank
4	0	0	0	0	0	0	LB = grass/bank RB = bank
5	0	0	0	0	0	0	LB = grass/bank RB = grass/bank
6	0	0	0	0	0	3	LB = grass RB = grass
7	0	0	0	0	0	0	LB = grass RB = grass
8	0	0	0	0	0	0	LB = grass
9	0	0	0	0	0	0	LB = Bank
10	0	0	0	0	0	0	LB = Grass
11	0	0	0	0	0	0	

Transect Data

Project Site ID: BVC01	Stream Name: Beaver Creek	Transect Number
Date: 7/11/08		1 of 11
Habitat Type Along Transect (circle one): pool riffle [run]		

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	P	P
Bank Height (0.1 m)	1.56	1.52
Bank Angle (degrees)	24	16
Streambank length (0.1 m)	3.5	6.4
Length of Streambank Vegetated (0.1 m)	3.5	6.4
Length of Streambank Eroded (0.1 m)	0	0
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify	cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify
Animal Vegetation Use (circle one)	none, low, [moderate], high	none, low, [moderate], high
Riparian Vegetation Type (Dominant)	sedge/rush, cottonwoods, [grass/forb], green ash, willows, silver maple, shrubs, other_____	sedge/rush, cottonwoods, [grass/forb], green ash, willows, silver maple, shrubs, other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout, young/sapling, mature, decadent, dead, [none]	seedling/sprout, young/sapling, mature, decadent, dead, [none]
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	*Juncus sp.* 0.2	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0.0			
LBF	1.0	0.0		
LEW	2.6	0.66	0.00	
LCB	3.3	0.73	0.12	
STR (@1/4)	4.5	0.74	0.18	
STR (@1/2)	6.0	0.77	0.23	
STR (@3/4)	7.8	0.77	0.25	
RCB	8.7	0.69	0.16	
REW	9.2	0.56	0.00	
RBF	10.9	0.18		
RTB	14.6			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) = 14.6

Bankfull width (RBF-LBF)= 9.9

Channel Bottom Width (RCB-LCB)= 5.4

Stream Width (REW-LEW)= 6.6

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC01	Stream Name: Beaver Creek	Transect Number 2 of 11
Date: 7/11/08		
Habitat Type Along Transect (circle one): pool riffle [run]		

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	A	A
Bank Height (0.1 m)	2.57	2.80
Bank Angle (degrees)	**8**	55
Streambank length (0.1 m)	10.35	3.2
Length of Streambank Vegetated (0.1 m)	10.32	3.2
Length of Streambank Eroded (0.1 m)	0	0
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0.10
Undercut Bank (0.1 m)	0	010
Riparian landuse (circle one)	Cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / low / [moderate] / high	none / low / [moderate] / high
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout / young/sapling / mature / decadent / dead / [not present]	seedling/sprout / young/sapling / mature / decadent / dead / [not present]
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	*Juncus sp.* 0.5	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	20.5			
LBF	27.3	0.0		
LEW	28.0	0.59	0.00	
LCB	30.0	0.95	0.35	
STR (@1/4)	31.0	1.09	0.48	
STR (@1/2)	32.4	1.20	0.54	
STR (@3/4)	33.9	1.24	0.53	
RCB	34.7	1.18	0.46	
REW	35.0	0.77	0.00	
RBF	35.0	0.25		
RTB	36.2			

Location Codes:

LTB left top bank

RTB right top bank
LBF left bankfull
RBF right bankfull

LCB left channel bottom
RCB right channel bottom
LEW left edge water

REW right edge water
STR stream

Bank top width (RTB-LTB) =___15.7_____

Bankfull width (RBF-LBF)=____7.7____

Channel Bottom Width (RCB-LCB)=____4.7_____

Stream Width (REW-LEW)=____7.0_____

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC01	Stream Name: Beaver Creek	Transect Number
Date: 7/11/08		3 of 11
Habitat Type Along Transect (circle one): pool [riffle] run		

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	A	A
Bank Height (0.1 m)	1.9	2.5
Bank Angle (degrees)	8	54
Streambank length (0.1 m)	12.7	3.0
Length of Streambank Vegetated (0.1 m)	12.7	2.0
Length of Streambank Eroded (0.1 m)	0	1.0
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / low / [moderate] / high	none / low / [moderate] / high
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout / young/sapling / mature / decadent / dead / [none]	seedling/sprout / young/sapling / mature / [decadent] / dead / [none]
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	*Juncus sp.* 0.2, grass sp. 0.2. Total = 0.4	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	20.0			
LBF	29.1	0.00		
LEW	31.7	0.67	0.00	
LCB	32.4	0.77	0.11	
STR (@1/4)	33.2	0.85	0.17	
STR (@1/2)	34.1	0.87	0.19	
STR (@3/4)	35.0	0.93	0.18	
RCB	35.4	0.91	0.15	
REW	35.8	0.77	0.00	
RBF	35.9	0.35		
RTB	37.0			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) = 17.0

Bankfull width (RBF-LBF) = 6.8

Channel Bottom Width (RCB-LCB) = 3.0

Stream Width (REW-LEW) = 4.1

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC01	Stream Name: Beaver Creek	Transect Number
Date: 7/11/08		4 of 11
Habitat Type Along Transect (circle one):	[pool] riffle run	

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	A	A
Bank Height (0.1 m)	1.6	2.0
Bank Angle (degrees)	14	25
Streambank length (0.1 m)	7.9	6.0
Length of Streambank Vegetated (0.1 m)	7.4	5.4
Length of Streambank Eroded (0.1 m)	0.5	0.6
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify	cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify
Animal Vegetation Use (circle one)	none, low, [moderate], high	none, low, [moderate], high
Riparian Vegetation Type (Dominant)	sedge/rush, cottonwoods, [grass/forb], green ash, willows, silver maple, shrubs, other_____	sedge/rush, cottonwoods, [grass/forb], green ash, willows, silver maple, shrubs, other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout, young/sapling, mature, decadent, dead, [none]	seedling/sprout, young/sapling, mature, decadent, dead, [none]
Submergent Macrophytes (0.1 m)	*Chara sp.* 0.5	
Emergent Macrophytes (0.1 m)	*Juncus sp.* 0.5	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0.3			
LBF	5.8	0.00		
LEW	6.1	0.65	0.00	
LCB	7.6	0.80	0.27	
STR (@1/4)	8.5	0.81	0.23	
STR (@1/2)	9.9	0.91	0.29	
STR (@3/4)	11.8	1.10	0.26	
RCB	12.7	0.85	0.22	
REW	13.4	0.70	0.00	
RBF	13.9	0.00		
RTB	19.4			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) = 19.1

Bankfull width (RBF-LBF) = 8.2

Channel Bottom Width (RCB-LCB) = 5.1

Stream Width (REW-LEW) = 7.3

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC01	Stream Name: Beaver Creek	Transect Number
Date: 7/11/08		5 of 11
Habitat Type Along Transect (circle one):	pool riffle run	

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	A	A
Bank Height (0.1 m)	2.1	2.1
Bank Angle (degrees)	21	32
Streambank length (0.1 m)	7.7	4.2
Length of Streambank Vegetated (0.1 m)	7.7	3.18
Length of Streambank Eroded (0.1 m)	0	0.2
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0.2	0.1
Undercut Bank (0.1 m)	0.2	0
Riparian landuse (circle one)	Cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / low / [moderate] / high	none / low / [moderate] / high
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout / young/sapling / mature / decadent / dead / [none]	seedling/sprout / young/sapling / mature / decadent / dead / [none]
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	*Juncus sp.* 0.3	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0.4			
LBF	6.2	0.00		
LEW	6.5	0.70	0.02	
LCB	7.2	0.98	0.35	
STR (@1/4)	8.5	1.12	0.49	
STR (@1/2)	10.1	1.28	0.59	
STR (@3/4)	12.5	1.12	0.48	
RCB	13.8	0.99	0.30	
REW	14.1	0.87	0.15	
RBF	14.6	0.00		
RTB	17.0			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) =___16.6____

Bankfull width (RBF-LBF)=____ 8.4___

Channel Bottom Width (RCB-LCB)=____ 6.7___

Stream Width (REW-LEW)=____7.7

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC01	Stream Name: Beaver Creek	Transect Number
Date: 7/11/08		6 of 11
Habitat Type Along Transect (circle one):	[pool] riffle run	

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	A	A
Bank Height (0.1 m)	1.9	1.9
Bank Angle (degrees)	22	36
Streambank length (0.1 m)	7.0	3.4
Length of Streambank Vegetated (0.1 m)	6.9	3.2
Length of Streambank Eroded (0.1 m)	0.1	0.2
Length of Streambank Deposition (0.1 m)	0	2.5
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0.1	0.1
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / low / [moderate] / high	none / low / [moderate] / high
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout / young/sapling / mature / decadent / dead / [none]	seedling/sprout / young/sapling / mature / decadent / dead / [none]
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	*Juncus sp.* 0.1	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	2.0			
LBF	5.0	0.00		
LEW	5.7	0.61	0.00	
LCB	5.8	0.89	0.34	
STR (@1/4)	7.4	0.90	0.48	
STR (@1/2)	9.4	1.03	0.55	
STR (@3/4)	11.7	0.98	0.44	
RCB	13.4	0.91	0.37	
REW	13.9	0.79	0.24	
RBF	14.5	0.05		
RTB	15.3			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) =__13.3___

Bankfull width (RBF-LBF)=____9.5__

Channel Bottom Width (RCB-LCB)=__7.6____

Stream Width (REW-LEW)=___8.2___

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC01	Stream Name: Beaver Creek	Transect Number
Date: 7/11/08		7 of 11
Habitat Type Along Transect (circle one): pool	riffle	run

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	P	P
Bank Height (0.1 m)	1.7	1.5
Bank Angle (degrees)	22	23
Streambank length (0.1 m)	5.8	4.8
Length of Streambank Vegetated (0.1 m)	5.7	4.6
Length of Streambank Eroded (0.1 m)	0.1	0.2
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland / pasture/rangeland / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / pasture/rangeland / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / low / moderate / high	none / low / moderate / high
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / grass/forb / green ash / willows / silver maple / shrubs / other_____	sedge/rush / cottonwoods / grass/forb / green ash / willows / silver maple / shrubs / other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout / young/sapling / mature / decadent / dead / none	seedling/sprout / young/sapling / mature / decadent / dead / none
Submergent Macrophytes (0.1 m)	*Chara sp.* 0.05	
Emergent Macrophytes (0.1 m)	Juncus Sp. & Grass 0.30	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	1.0			
LBF	4.7	0.00		
LEW	5.4	0.60	0.17	
LCB	6.0	0.62	0.20	
STR (@1/4)	7.1	0.58	0.16	
STR (@1/2)	8.5	0.50	0.17	
STR (@3/4)	6.0	0.49	0.19	
RCB	10.7	0.44	0.15	
REW	11.2	0.35	0.01	
RBF	13.4	0.03		
RTB	15.0			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) =___14.0__

Bankfull width (RBF-LBF)=____8.7__

Channel Bottom Width (RCB-LCB)=____4.7___

Stream Width (REW-LEW)=_____5.8__

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC01	Stream Name: Beaver Creek	Transect Number
Date: 7/11/08		8 of 11
Habitat Type Along Transect (circle one): pool	riffle	run

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	P	P
Bank Height (0.1 m)	1.9	1.6
Bank Angle (degrees)	25	11
Streambank length (0.1 m)	4.3	5.5
Length of Streambank Vegetated (0.1 m)	3.9	5.3
Length of Streambank Eroded (0.1 m)	0.4	0.2
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0.10	0
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / low / [moderate] / high	none / low / [moderate] / high
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout / young/sapling / mature / decadent / dead / [none]	seedling/sprout / young/sapling / mature / [decadent] / dead / none
Submergent Macrophytes (0.1 m)	*Chara sp.* 0.1	
Emergent Macrophytes (0.1 m)	*Juncus sp.* 0.25	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0.7			
LBF	4.0	0.00		
LEW	4.1	0.58	0.13	
LCB	4.4	0.75	0.30	
STR (@1/4)	5.6	0.58	0.29	
STR (@1/2)	7.0	0.48	0.18	
STR (@3/4)	8.6	0.42	0.17	
RCB	9.9	0.38	0.15	
REW	10.3	0.35	0.10	
RBF	10.6	0.00		
RTB	14.5			

Location Codes:

LTB left top bank

RTB right top bank
LBF left bankfull
RBF right bankfull

LCB left channel bottom
RCB right channel bottom
LEW left edge water

REW right edge water
STR stream

Bank top width (RTB-LTB) = 16.9

Bankfull width (RBF-LBF)= 11.3

Channel Bottom Width (RCB-LCB)= 8.1

Stream Width (REW-LEW)= 8.1

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC01	Stream Name: Beaver Creek	Transect Number 9 of 11
Date: 7/11/08		
Habitat Type Along Transect (circle one): pool [riffle] run		

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	P	A
Bank Height (0.1 m)	2.2	2.0
Bank Angle (degrees)	32	12.5
Streambank length (0.1 m)	3.9	8.4
Length of Streambank Vegetated (0.1 m)	2.9	8.2
Length of Streambank Eroded (0.1 m)	1.0	0.2
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0.1	0
Undercut Bank (0.1 m)	0.1	0
Riparian landuse (circle one)	Cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / low / [moderate] / high	none / low / [moderate] / high
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout / young/sapling / mature / decadent / dead / [none]	seedling/sprout / young/sapling / mature / decadent / dead / [none]
Submergent Macrophytes (0.1 m)	*Chara sp.* 0.20	
Emergent Macrophytes (0.1 m)	*Juncus sp.* 0.1	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	3.7			
LBF	5.5	0.0		
LEW	6.5	0.2	0.05	
LCB	7.0	0.2	0.10	
STR (@1/4)	8.8	0.4	0.31	
STR (@1/2)	10.4	0.3	0.35	
STR (@3/4)	12.2	0.4	0.31	
RCB	14.3	0.2	0.14	
REW	14.7	0.0	0.01	
RBF	14.9	-0.4		
RTB	22.6			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) =___18.9___

Bankfull width (RBF-LBF)=____ 9.4___

Channel Bottom Width (RCB-LCB)=____ 7.3___

Stream Width (REW-LEW)=____8.2

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC01	Stream Name: Beaver Creek	Transect Number 10 of 11
Date: 7/11/08		
Habitat Type Along Transect (circle one):	[pool] riffle run	

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	P	A
Bank Height (0.1 m)	2.0	1.7
Bank Angle (degrees)	33	34.5
Streambank length (0.1 m)	6.0	7.6
Length of Streambank Vegetated (0.1 m)	4.5	6.60
Length of Streambank Eroded (0.1 m)	1.5	1.0
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0.1	0
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify	cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify
Animal Vegetation Use (circle one)	none, low, [moderate], high	none, low, [moderate], high
Riparian Vegetation Type (Dominant)	sedge/rush, cottonwoods, [grass/forb], green ash, willows, silver maple, shrubs, other_____	sedge/rush, cottonwoods, [grass/forb], green ash, willows, silver maple, shrubs, other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout, young/sapling, mature, decadent, dead, [none]	seedling/sprout, young/sapling, mature, decadent, dead, [none]
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	*Juncus sp.* 0.1	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	-0.6			
LBF	2.6	0.0		
LEW	2.9	0.60	0.01	
LCB	3.9	1.19	0.60	
STR (@1/4)	5.0	1.04	0.58	
STR (@1/2)	6.3	0.87	0.45	
STR (@3/4)	8.2	0.82	0.24	
RCB	9.2	0.92	0.18	
REW	9.8	0.84	0.00	
RBF	11.5	0		
RTB	16.0			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) = 16.6

Bankfull width (RBF-LBF)= 8.9

Channel Bottom Width (RCB-LCB)= 5.3

Stream Width (REW-LEW)= 6.9

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC01	Stream Name: Beaver Creek	Transect Number
Date: 7/11/08		11 of 11
Habitat Type Along Transect (circle one):	pool riffle run	

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	P	P
Bank Height (0.1 m)	2.1	1.9
Bank Angle (degrees)	30	30
Streambank length (0.1 m)	4.3	4.0
Length of Streambank Vegetated (0.1 m)	3.6	3.9
Length of Streambank Eroded (0.1 m)	0.7	0.1
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify	cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify
Animal Vegetation Use (circle one)	none, low, [moderate], high	none, low, [moderate], high
Riparian Vegetation Type (Dominant)	sedge/rush, cottonwoods, [grass/forb], green ash, willows, silver maple, shrubs, other_____	sedge/rush, cottonwoods, [grass/forb], green ash, willows, silver maple, shrubs, other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout, young/sapling, mature, decadent, dead, [none]	seedling/sprout, young/sapling, mature, decadent, dead, [none]
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	*Juncus Sp.* 0.5	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	1.0			
LBF	2.8	0.0		
LEW	3.6	0.90	0.00	
LCB	4.0	1.15	0.30	
STR (@1/4)	5.4	1.42	0.52	
STR (@1/2)	7.0	1.53	0.63	
STR (@3/4)	9.0	1.45	0.55	
RCB	9.7	1.30	0.41	
REW	11.0	0.96	0.00	
RBF	11.6	0.44		
RTB	13.6			

Location Codes:

LTB left top bank

RTB right top bank
LBF left bankfull
RBF right bankfull

LCB left channel bottom
RCB right channel bottom
LEW left edge water

REW right edge water
STR stream

Bank top width (RTB-LTB) =___12.6__

Bankfull width (RBF-LBF)=_____8.8_

Channel Bottom Width (RCB-LCB)=___5.6

Stream Width (REW-LEW)=____7.4__

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

On Site Description Data

Section A

Project Site ID: BVC04		T____, R____, 1/4 of Sec____		Date: 14 APR 2008
Stream Name: Beaver Creek				Time: 17:32
Transect 1 (Upstream)			Transect 11 (Downstream)	
GPS Coordinates (utm):	Northing: 4810963	Easting: 0579684	Northing:	Easting:
Investigators: C. Foreman, G. McKee (Sections A, B, C), A. Wones, K. Shook, E. Krantz (Sections D, E, F, G, H, I, J)				

Section B

Preliminary Mean Stream Width (PMSW)

	Width Number											
	1	2	3	4	5	6	7	8	9	10	Sum	Avg. PMSW
Width (0.1m)	6.1	7.1	3.6	6.7	7.7	7.0	8.0	5.5	5.4	4.5	61.6	6.2

Transect Spacing *: 18.5

*If PMSW <10m space transects every 3 PMSW; If >10m, transects are spaced every 2 PMSW.

Total Reach Length: 184.9

Reach Length = 11 Transects, 10 distances apart X 3 PMSW = 30 PMSW or 20 PMSW if width >10m.

Section C

Water Quality

Reading	Time (2400)	Water Temperature (°C)	Air Temperature (oC)	Turbidity (NTU)	Secchi (cm)	Dissolved Oxygen (mg/L	Specific Conductance (µS/cm)	Conductivity (µS/cm)
Morning	11:28	7.0	-	-	-	-	-	-
Afternoon	18:43	16.03	-	11.8	-	9.20	5109	

Visual Observations

1) Odor (~~Yes~~ / No)	**2) Septic (~~Yes~~ / No)**	**3) Deadfish (~~Yes~~ / No)**	**4) Surface Film (~~Yes~~ / No)**
5) Color: Clear		**6) Ice Cover (~~Yes~~ / No)**	

Weather Conditions:	Current	Past 24 hrs.
Clear/sunny	✓	✓
Partly cloudy	☐	☐
Intermittent showers	☐	☐
Steady rain	☐	☐
Heavy rain	☐	☐

Field Comments: Heavy silt deposition in pools.

Section D

Habitats Available number of each (also place on map Section E)

Pool 2 Run/Glide 2 Riffle 3 Other (describe) see Table 1

Lengths of Riffle(s): 22.0, 22.0, 10.7, _____, _____.

Nearest Transect # : 1,2, 2,3, 8, _____, _____.

Total Length (riffles) = 54.6

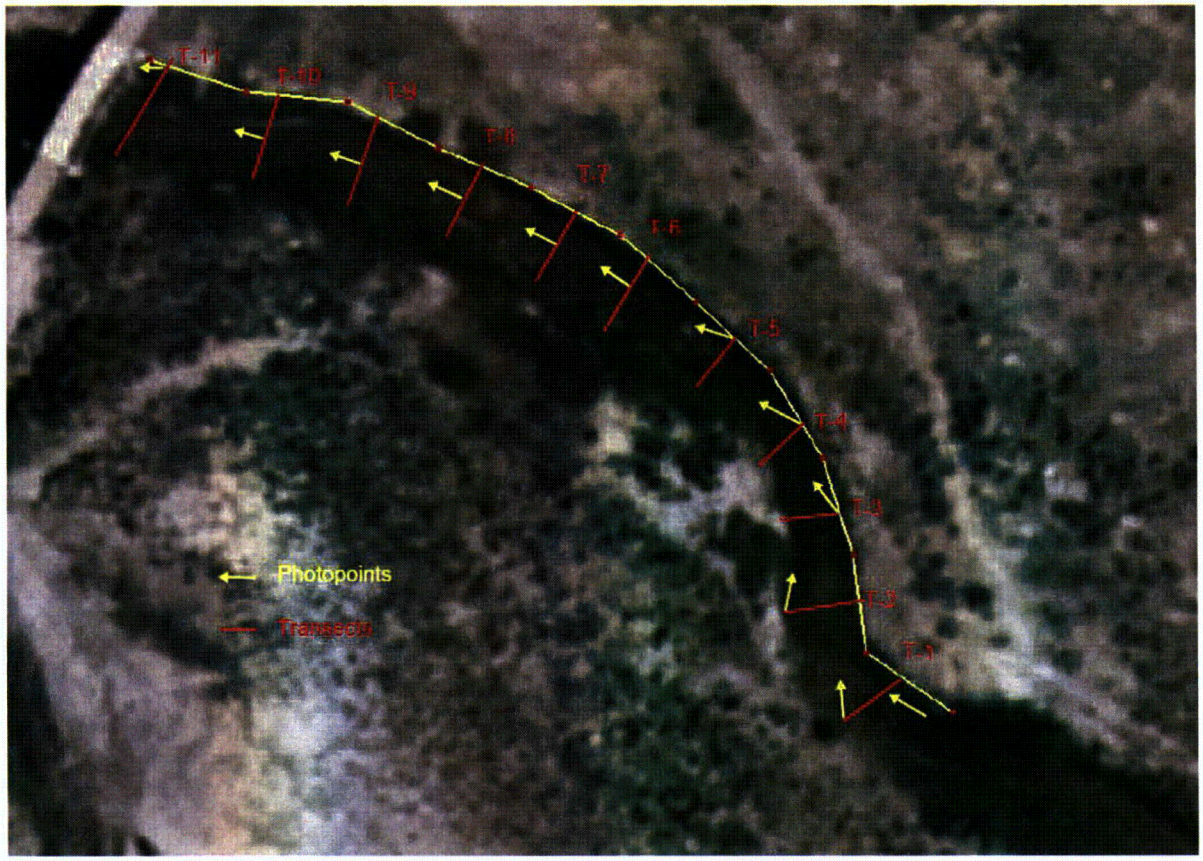
Pool Forming Elements See Table 1= _____LS, F

Map, Slope Measurements, and Photo-documentation Data

Project Site ID: BVC04	**Stream Name: Beaver Creek**	Date: 16 APR 2008

Section E cont.

Draw a map of the site with location of most upstream and most downstream transects. Include locations of photographic points, direction of photograph, and frame number.



Approximately 200 m.

Bed Substrate Composition

Project Site ID:BVC04	Stream Name: Beaver Creek	Date: 16 APR 2008

Section F

Organic Substrates

	Description	Tally	Number
Detritus	sticks, wood, coarse plant material (CPOM)		1
Muck-Mud	black, very fine organic (FPOM)		

Inorganic Substrates

	Diameter	Tally	Number
Clay	<0.004 (slick)		1
Silt	0.004-0.062		26
Sand	0.062-2 (gritty)		4
Very Fine Gravel	>2-4		3
Fine Gravel	>4-8		3
Medium Gravel	>8-16		3
Coarse Gravel	>16-32		5
Very Coarse Gravel	>32-64		5
Cobble	>64-128		4
Large Cobble	>128-256		
Boulder	>256-512		
Large Boulder	>512		
		Total Number:	55

Section G

Large Woody Debris Data

1

Project Site ID: BVC04 Stream Name: Beaver Creek m/d/yr: 04/16/2008 Page 1 of 1

Transect Spacing	Log Jam Number	LWD Number	Zone	Meander Location	Habitat Association	Angle	Length	Diameter
1-2	0	0						
2-3	0	0						
3-4	0	0						
4-5	0	1	2	IM	Run	0	4.5	0.25
5-6	1	1	2	OM	Riffle	90	3.0	0.15
5-6	1	2	2	OM	Riffle	45	1.5	0.10
5-6	1	3	2	OM	Riffle	35	1.8	0.25
5-6	1	4	2	OM	Riffle	125	2.0	0.10
5-6	1	5	2	OM	Riffle	45	1.6	0.15
6-7	0	0						
7-8	0	0						
8-9	0	1	2	SS	Riffle	45	2.0	0.17
8-9	0	2	2	SS	Riffle	45	2.2	0.15
9-10	0	0						
10-11	0	0						

Zone: Zone 1 is water surface at baseflow, Zone 2 is between baseflow surface and bankfull flow surface, Zone 3 is bankfull channel width above bankfull flow surface.

Meander Location: IM=inside meander, OM=outside meander, CO=crossover, SS=straight section

Habitat Association: PL=pool, RF=riffle, RN=run

LARGE WOODY DEBRIS CATEGORIES (≥10 cm small end diameter, ≥1.5 m length)				
Categories	1	2	3	4
Diameter Large End	0.1-<0.3m	0.3-0.6m	0.6-0.8m	>0.8m
Length	>1.5-5m	5-15m	>15m	-

Stream Shade and Canopy Cover Monitoring

Project Site ID:BVC04	Stream Name: Beaver Creek	Date: 16 APR 2008

Section H

Site Name:BVC04							Date: 4/16/2008
Reach Length: 220 m				Transect Interval: 22 m			Initials: AW
Transect	Left Bank	Center Upstream	Center Right	Center-downstream	Center Left	Right Bank	Comments:
1	0	0	0	0	0	5	RB = Shrubs
2	0	0	0	0	0	2	RB = Tree
3	0	0	0	0	0	5	RB = Tree
4	2	0	0	0	0	0	LB = Shrubs
5	6	0	0	0	0	0	LB = Shrubs
6	4	0	0	0	0	0	LB = Bank
7	8	0	0	0	0	3	LB = Bank RB = Shrub
8	6	0	0	0	0	0	LB = Bank
9	3	0	0	0	0	10	LB = Bank RB = Shrubs
10	2	0	0	0	0	4	LB = Forbs RB = Grass
11	5	13	0	0	4	4	LB, CU, CL = Bridge RB = Shrubs
Note: No leaves on trees and shrubs. Cover from shrubs reported here is more potential than actual cover at this time of year.							

Transect Data

Project Site ID: BVC04	Stream Name: Beaver Creek	Transect Number
Date: 4/16/08		1 of 11
Habitat Type Along Transect (circle one): pool [riffle] run		

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	A	P
Bank Height (0.1 m)	3.7	3.9
Bank Angle (degrees)	26.0	40.0
Streambank length (0.1 m)	8.0	6.0
Length of Streambank Vegetated (0.1 m)	8.0	5.4
Length of Streambank Eroded (0.1 m)	0	0.6
Length of Streambank Deposition (0.1 m)	0.4	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify	cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify
Animal Vegetation Use (circle one)	none, [low], moderate, high	none, [low], moderate, high
Riparian Vegetation Type (Dominant)	sedge/rush, cottonwoods, [grass/forb], green ash, willows, silver maple, shrubs, other_____	sedge/rush, cottonwoods, [grass/forb], green ash, willows, silver maple, shrubs, other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout, young/sapling, [mature], decadent, dead	seedling/sprout, young/sapling, mature, decadent, dead
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	0	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0.3			
LBF	5.1	0.0		
LEW	7.1	* 1.0	0.0	
LCB	7.9	1.1	0.18	
STR (@1/4)	9.1	1.2	0.19	
STR (@1/2)	10.1	1.2	0.21	
STR (@3/4)	11.6	1.4	0.20	
RCB	12.2	1.3	0.17	
REW	13.1	* 1.3	0.09	
RBF	13.5	0.4		
RTB	17.4			

Location Codes:

LTB left top bank

RTB right top bank
LBF left bankfull
RBF right bankfull

LCB left channel bottom
RCB right channel bottom
LEW left edge water

REW right edge water
STR stream

Bank top width (RTB-LTB) =___17.1_____

Bankfull width (RBF-LBF)=____8.4____

Channel Bottom Width (RCB-LCB)=____4.4_____

Stream Width (REW-LEW)=____6.0_____

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC04	Stream Name: Beaver Creek	Transect Number
Date: 4/16/08		2 of 11
Habitat Type Along Transect (circle one): pool [riffle] run		

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	A	P
Bank Height (0.1 m)	2.3	2.2
Bank Angle (degrees)	**27**	34
Streambank length (0.1 m)	4.6	4.8
Length of Streambank Vegetated (0.1 m)	4.0	3.6
Length of Streambank Eroded (0.1 m)	0.6	1.2
Length of Streambank Deposition (0.1 m)	0	0.4
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / [low] / moderate / high	none / [low] / moderate / high
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout / young/sapling / mature / decadent / dead / [not present]	seedling/sprout / young/sapling / [mature] / decadent / dead
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	0	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0.3			
LBF	1.8	0.0		
LEW	4.1	* 0.3	0.0	
LCB	4.6	0.4	0.20	
STR (@1/4)	5.4	0.3	0.12	
STR (@1/2)	6.4	0.3	0.12	
STR (@3/4)	7.5	0.4	0.17	
RCB	8.1	0.4	0.17	
REW	8.8	* 0.3	0.0	
RBF	10.0	0.0		
RTB	11.0			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) = 10.7

Bankfull width (RBF-LBF)= 8.2

Channel Bottom Width (RCB-LCB)= 3.5

Stream Width (REW-LEW)= 4.7

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC04	Stream Name: Beaver Creek	Transect Number
Date: 4/16/08		3 of 11
Habitat Type Along Transect (circle one): pool [riffle] run		

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	P	P
Bank Height (0.1 m)	1.8	2.0
Bank Angle (degrees)	11	50
Streambank length (0.1 m)	11.3	2.4
Length of Streambank Vegetated (0.1 m)	10.7	1.2
Length of Streambank Eroded (0.1 m)	0.6	1.2
Length of Streambank Deposition (0.1 m)	0	0.4
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	1.0
Undercut Bank (0.1 m)	0	0.1
Riparian landuse (circle one)	Cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify	cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify
Animal Vegetation Use (circle one)	none, [low], moderate, high	none, [low], moderate, high
Riparian Vegetation Type (Dominant)	sedge/rush, cottonwoods, [grass/forb], green ash, willows, silver maple, shrubs, other_____	sedge/rush, cottonwoods, [grass/forb], green ash, willows, silver maple, shrubs, other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout, young/sapling, mature, decadent, dead, [none]	seedling/sprout, young/sapling, mature, [decadent], dead
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	0	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	1.4			
LBF	10.6	0.0		
LEW	11.7	* 0.4	0.0	
LCB	12.0	0.4	0.06	
STR (@1/4)	12.7	0.5	0.11	
STR (@1/2)	13.7	0.5	0.12	
STR (@3/4)	14.9	0.5	0.13	
RCB	15.9	0.6	0.20	
REW	15.9	* 0.6	0.20	
RBF	16.6	0.0		
RTB	17.3			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) =___15.9_____

Bankfull width (RBF-LBF)=____5.9____

Channel Bottom Width (RCB-LCB)=____4.0_____

Stream Width (REW-LEW)=____4.2_____

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC04	Stream Name: Beaver Creek	Transect Number
Date: 4/16/08		4 of 11
Habitat Type Along Transect (circle one): pool [riffle] run		

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	P	A
Bank Height (0.1 m)	1.8	1.6
Bank Angle (degrees)	26.5	38.0
Streambank length (0.1 m)	4.7	3.0
Length of Streambank Vegetated (0.1 m)	3.5	2.6
Length of Streambank Eroded (0.1 m)	1.2	0.4
Length of Streambank Deposition (0.1 m)	0.6	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify	cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify
Animal Vegetation Use (circle one)	none, [low], moderate, high	none, [low], moderate, high
Riparian Vegetation Type (Dominant)	sedge/rush, cottonwoods, [grass/forb], green ash, willows, silver maple, shrubs, other_____	sedge/rush, cottonwoods, [grass/forb], green ash, willows, silver maple, shrubs, other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout, young/sapling, mature, decadent, dead, [none]	seedling/sprout, young/sapling, mature, decadent, dead, [none]
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	0	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0			
LBF	3.0	0.0		
LEW	4.1	* 0.5	0.0	
LCB	4.5	0.6	0.15	
STR (@1/4)	6.0	0.5	0.09	
STR (@1/2)	7.5	0.4	0.10	
STR (@3/4)	9.1	0.4	0.10	
RCB	10.5	0.4	0.05	
REW	11.0	* 0.4	0	
RBF	12.3	-0.1		
RTB	13.1			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) =___13.1_____

Bankfull width (RBF-LBF)=____9.3____

Channel Bottom Width (RCB-LCB)=____6.0_____

Stream Width (REW-LEW)=____6.9_____

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC04	Stream Name: Beaver Creek	Transect Number 5 of 11
Date: 4/16/08		
Habitat Type Along Transect (circle one): pool riffle [run]		

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	A	P
Bank Height (0.1 m)	2.5	2.2
Bank Angle (degrees)	48	40.0
Streambank length (0.1 m)	3.2	6.0
Length of Streambank Vegetated (0.1 m)	0.3	5.4
Length of Streambank Eroded (0.1 m)	2.9	0.6
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland, woodland/forested, [pasture/rangeland], barnyard, prairie, developed, wetland, other-specify, shrub	cropland, woodland/forested, [pasture/rangeland], barnyard, prairie, developed, wetland, other-specify, shrub
Animal Vegetation Use (circle one)	none, moderate, [low], high	none, moderate, [low], high
Riparian Vegetation Type (Dominant)	sedge/rush, willows, cottonwoods, silver maple, grass/forb, [shrubs], green ash, other_____	sedge/rush, willows, cottonwoods, silver maple, grass/forb, [shrubs], green ash, other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout, decadent, young/sapling, dead, mature, [none]	seedling/sprout, [decadent], young/sapling, dead, mature
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	0	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0.3			
LBF	1.3	0.0		
LEW	2.5	0.8	0.00	
LCB	2.8	1.0	0.20	
STR (@1/4)	9.7	1.0	0.28	
STR (@1/2)	5.5	0.8	0.15	
STR (@3/4)	7.3	0.7	0.12	
RCB	8.7	0.7	0.06	
REW	9.0	0.7	0.00	
RBF	11.0	0.0		
RTB	14.3			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) = 14.0

Bankfull width (RBF-LBF) = 9.7

Channel Bottom Width (RCB-LCB) = 5.9

Stream Width (REW-LEW) = 6.5

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth *minus* L(R)CB Water Depth.

Transect Data

Project Site ID: BVC04	Stream Name: Beaver Creek	Transect Number
Date: 4/16/08		6 of 11
Habitat Type Along Transect (circle one):	[pool] riffle run	

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	P	A
Bank Height (0.1 m)	3.5	3.6
Bank Angle (degrees)	46	20
Streambank length (0.1 m)	4.6	6.3
Length of Streambank Vegetated (0.1 m)	1.6	5.6
Length of Streambank Eroded (0.1 m)	2.8	0.7
Length of Streambank Deposition (0.1 m)	0	2.5
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / [low] / moderate / high	none / [low] / moderate / high
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout / young/sapling / mature / decadent / dead / [none]	seedling/sprout / young/sapling / mature / [decadent] / dead
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	0	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0.0			
LBF	1.9	0		
LEW	2.7	0.4*	0.00	
LCB	3.2	0.6	0.24	
STR (@1/4)	4.4	0.7	0.31	
STR (@1/2)	6.1	0.7	0.26	
STR (@3/4)	8.0	0.6	0.20	
RCB	8.8	0.6	0.10	
REW	10.0	0.5*	0.00	
RBF	13.1	0.0		
RTB	12.1			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) = 17.1

Bankfull width (RBF-LBF) = 11.3

Channel Bottom Width (RCB-LCB) = 5.6

Stream Width (REW-LEW) = 7.3

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC04	Stream Name: Beaver Creek	Transect Number
Date: 4/16/08		7 of 11
Habitat Type Along Transect (circle one):	[pool] riffle run	

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	P	A
Bank Height (0.1 m)	3.2	3.1
Bank Angle (degrees)	55	50
Streambank length (0.1 m)	4.0	5.2
Length of Streambank Vegetated (0.1 m)	1.8	4.2
Length of Streambank Eroded (0.1 m)	2.2	1.0
Length of Streambank Deposition (0.1 m)	0	0.5
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0.2
Undercut Bank (0.1 m)	0	0.25
Riparian landuse (circle one)	Cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / [low] / moderate / high	none / [low] / moderate / high
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____	sedge/rush / cottonwoods / grass/forb / green ash / willows / silver maple / [shrubs] / other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout / young/sapling / mature / decadent / dead / [none]	seedling/sprout / [young/sapling] / mature / decadent / dead
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	0	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	1.6			
LBF	3.4	0.0		
LEW	3.7	0.3	0.00	
LCB	4.0	0.5	0.20	
STR (@1/4)	6.4	0.8	0.60	
STR (@1/2)	8.5	0.6	0.61	
STR (@3/4)	11.4	0.7	0.73	
RCB	13.7	0.4	0.42	
REW	14.3	0.2	0.04	
RBF	14.5	-0.5		
RTB	17.7			

Location Codes:

LTB left top bank

RTB right top bank
LBF left bankfull
RBF right bankfull

LCB left channel bottom
RCB right channel bottom
LEW left edge water

REW right edge water
STR stream

Bank top width (RTB-LTB) =__16.1__

Bankfull width (RBF-LBF)=____11.1__

Channel Bottom Width (RCB-LCB)=____9.7___

Stream Width (REW-LEW)=_____10.7__

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC04	Stream Name: Beaver Creek	Transect Number
Date: 4/16/08		8 of 11
Habitat Type Along Transect (circle one): pool [riffle] run		

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	P	P
Bank Height (0.1 m)	3.2	3.1
Bank Angle (degrees)	55	25
Streambank length (0.1 m)	3.9	8.3
Length of Streambank Vegetated (0.1 m)	1.3	5.8
Length of Streambank Eroded (0.1 m)	2.6	2.5
Length of Streambank Deposition (0.1 m)	0	0.4
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / [low] / moderate / high	none / [low] / moderate / high
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____	sedge/rush / cottonwoods / grass/forb / green ash / willows / silver maple / [shrubs] / other_____
Riparian Age Class(es) of Trees, if present	*seedling/sprout* / young/sapling / mature / *decadent* / dead / [none]	*seedling/sprout* / young/sapling / mature / *decadent* / dead / [none]
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	0	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	1.4			
LBF	2.4	0.0		
LEW	3.4	0.6*	0.10	
LCB	3.5	0.6	0.04	
STR (@1/4)	4.3	0.6	0.18	
STR (@1/2)	8.5	0.5	0.12	
STR (@3/4)	10.6	0.5	0.18	
RCB	11.6	0.5	0.16	
REW	11.6	0.5*	0.16	
RBF	13.7	0.0		
RTB	18.3			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) = 16.9

Bankfull width (RBF-LBF) = 11.3

Channel Bottom Width (RCB-LCB) = 8.1

Stream Width (REW-LEW) = 8.1

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC04	Stream Name: Beaver Creek	Transect Number
Date: 4/16/08		9 of 11
Habitat Type Along Transect (circle one):	pool riffle run	

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	P	A
Bank Height (0.1 m)	3.2	3.2
Bank Angle (degrees)	48	24.5
Streambank length (0.1 m)	4.1	9.0
Length of Streambank Vegetated (0.1 m)	2.1	8.8
Length of Streambank Eroded (0.1 m)	2.0	0.2
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0.7
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / [low] / moderate / high	none / [low] / moderate / high
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / grass/forb / green ash / willows / silver maple / [shrubs] / other_____	sedge/rush / cottonwoods / grass/forb / green ash / willows / silver maple / [shrubs] / other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout / young/sapling / mature / decadent / dead / [none]	seedling/sprout / [young/sapling] / mature / decadent / dead
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	0	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	3.7			
LBF	5.5	0.0		
LEW	6.5	0.2	0.05	
LCB	7.0	0.2	0.10	
STR (@1/4)	8.8	0.4	0.31	
STR (@1/2)	10.4	0.3	0.35	
STR (@3/4)	12.2	0.4	0.31	
RCB	14.3	0.2	0.14	
REW	14.7	0.0	0.01	
RBF	14.9	-0.4		
RTB	22.6			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) = 18.9

Bankfull width (RBF-LBF) = 9.4

Channel Bottom Width (RCB-LCB) = 7.3

Stream Width (REW-LEW) = 8.2

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC04	Stream Name: Beaver Creek	Transect Number 10 of 11
Date: 4/16/08		
Habitat Type Along Transect (circle one):	[pool] riffle run	

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	A	A
Bank Height (0.1 m)	1.7	1.8
Bank Angle (degrees)	25	28
Streambank length (0.1 m)	3.0	4.2
Length of Streambank Vegetated (0.1 m)	2.7	3.8
Length of Streambank Eroded (0.1 m)	0.3	0.4
Length of Streambank Deposition (0.1 m)	0.8	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / [low] / moderate / high	none / low / [moderate] / high
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / grass/forb / green ash / willows / silver maple / shrubs / other_____	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout / young/sapling / mature / decadent / dead / [none]	seedling/sprout / young/sapling / mature / decadent / dead / [none]
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	0	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0.7			
LBF	1.8	0.0		
LEW	3.2	0.5	0.02	
LCB	3.5	0.6	0.10	
STR (@1/4)	4.9	0.7	0.26	
STR (@1/2)	7.3	0.7	0.35	
STR (@3/4)	8.5	0.6	0.30	
RCB	10.1	0.6	0.17	
REW	10.3	0.5	0.00	
RBF	10.4	0.1		
RTB	13.1			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) = 12.4

Bankfull width (RBF-LBF)= 8.6

Channel Bottom Width (RCB-LCB)= 6.6

Stream Width (REW-LEW)= 7.1

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC04	Stream Name: Beaver Creek	Transect Number
Date: 4/16/08		11 of 11
Habitat Type Along Transect (circle one):	[pool] riffle run	

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	P	P
Bank Height (0.1 m)	1.9	2.1
Bank Angle (degrees)	30	37
Streambank length (0.1 m)	3.2	3.7
Length of Streambank Vegetated (0.1 m)	1.7	2.7
Length of Streambank Eroded (0.1 m)	1.5	1.0
Length of Streambank Deposition (0.1 m)	2.0	0.5
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify	cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify
Animal Vegetation Use (circle one)	none, [low], moderate, high	none, [low], moderate, high
Riparian Vegetation Type (Dominant)	sedge/rush, cottonwoods, grass/forb, green ash, willows, silver maple, [shrubs], other_____	sedge/rush, cottonwoods, grass/forb, green ash, willows, silver maple, [shrubs], other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout, young/sapling, mature, decadent, dead, [none]	seedling/sprout, young/sapling, mature, decadent, dead, [none]
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	0	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0.0			
LBF	0.6	0.0		
LEW	3.0	0.6	0.01	
LCB	3.7	0.8	0.20	
STR (@1/4)	4.9	0.8	0.24	
STR (@1/2)	6.1	1.0	0.35	
STR (@3/4)	7.9	1.0	0.31	
RCB	8.8	1.0	0.20	
REW	9.6	0.8	0.00	
RBF	7.3	0.4		
RTB	12.5			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR *stream*

Bank top width (RTB-LTB) = 12.5

Bankfull width (RBF-LBF)= 6.7

Channel Bottom Width (RCB-LCB)= 5.2

Stream Width (REW-LEW)= 6.5

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

On Site Description Data

Section A

Project Site ID: BVC04	T____, R____, ____1/4 of Sec____		Date: 8 JUL 2008
Stream Name: Beaver Creek			Time: 12:05
Transect 1 (Upstream)		**Transect 11 (Downstream)**	
GPS Coordinates (utm): WGS 84	Northing: 4811175.61	Easting: 0579834.93	Northing: 4811171.63	Easting: 0579653.03
Investigators: A. Wones, K. Shook, L. Dunn			

Section B

Preliminary Mean Stream Width (PMSW)

	Width Number											
	1	2	3	4	5	6	7	8	9	10	Sum	Avg. PMSW
Width (0.1m)	6.1	7.1	3.6	6.7	7.7	7.0	8.0	5.5	5.4	4.5	61.6	6.2

Transect Spacing *: 18.5

*If PMSW <10m space transects every 3 PMSW. If >10m, transects are spaced every 2 PMSW.

Total Reach Length: *184.9*

Reach Length = 11 Transects, 10 distances apart X 3 PMSW = 30 PMSW or 20 PMSW if width >10m.

Section C

Water Quality

Reading	Time (2400)	Water Temperature (°C)	Air Temperature (oC)	Turbidity (NTU)	Secchi (cm)	Dissolved Oxygen (mg/L	Specific Conductance (µS/cm)	Conductivity (µS/cm)
Morning			-	-	-	-	-	-
Afternoon	12:05	24	25	-	-	-	-	-

Visual Observations

1) Odor (~~Yes~~ / No)	**2) Septic (~~Yes~~ / No)**	**3) Deadfish (~~Yes~~ / No)**	**4) Surface Film (~~Yes~~ / No)**
5) Color: Clear, Olive drab		**6) Ice Cover (~~Yes~~ / No)**	

Weather Conditions:	Current	Past 24 hrs
Clear/sunny	☐	☐
Partly cloudy	✓	☐
Intermittent showers	☐	✓
Steady rain	☐	☐
Heavy rain	☐	☐

Field Comments: Heavy silt deposition in pools.

Section D

Habitats Available number of each (also place on map Section E)

Pool 1 Run/Glide 3 Riffle 3 Other (describe) see Table 1

Lengths of Riffle(s): 25.3, 18.6 *, 14.0* . * Two sides of an island .

Nearest Transect # : 2, 4, 7, _____, _____.

Total Length (riffles) = 57.9

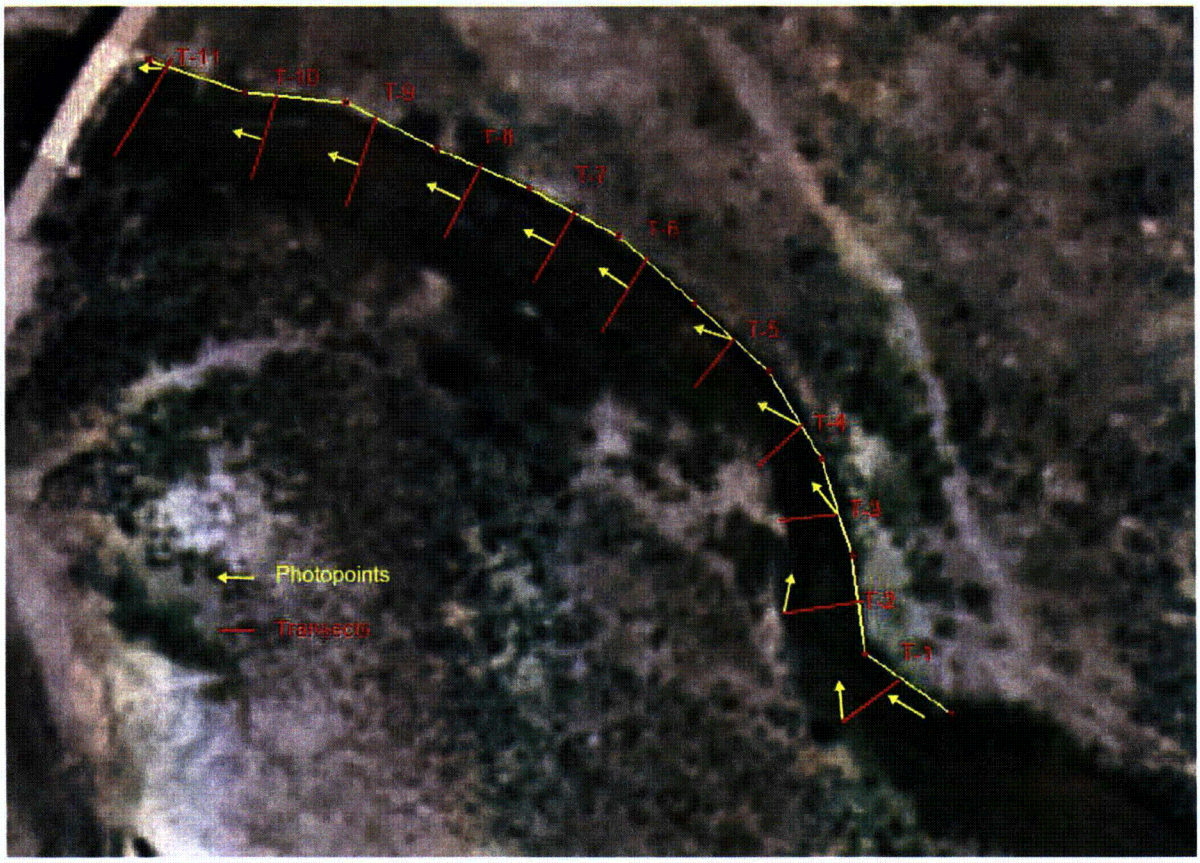
Pool Forming Elements See Table 1= F

Map, Slope Measurements, and Photo-documentation Data

Project Site ID: BVC04	**Stream Name: Beaver Creek**	Date: 8 July 2008

Section E cont.

Draw a map of the site with location of most upstream and most downstream transects. Include locations of photographic points, direction of photograph, and frame number.



Approximately 200 m.

Bed Substrate Composition

Project Site ID:BVC04	Stream Name: Beaver Creek	Date: 8JUL 2008

Section F

Organic Substrates			
	Description	Tally	Number
Detritus	sticks, wood, coarse plant material (CPOM)		
Muck-Mud	black, very fine organic (FPOM)		20
Inorganic Substrates			
	Diameter	Tally	Number
Clay	<0.004 (slick)		1
Silt	0.004-0.062		15
Sand	0.062-2 (gritty)		10
Very Fine Gravel	>2-4		0
Fine Gravel	>4-8		7
Medium Gravel	>8-16		9
Coarse Gravel	>16-32		13
Very Coarse Gravel	>32-64		18
Cobble	>64-128		11
Large Cobble	>128-256		1
Boulder	>256-512		
Large Boulder	>512		
		Total Number:	105

Section G

Large Woody Debris Data

1

Project Site ID: BVC04 Stream Name: Beaver Creek m/d/yr: 07/11/2008 Page 1 of 1

Transect Spacing	Log Jam Number	LWD Number	Zone	Meander Location	Habitat Association	Angle	Length	Diameter
1-2	0	0						
2-3	0	0						
3-4	0	0						
4-5	0	0						
5-6	0	0						
6-7	0	0						
7-8	0	1	2	SS	Riffle	250	2.0	0.12
8-9	0	0						
9-10	0	0						
10-11	0	2	3	SS	Pool	180	8.0	0.4

Zone: Zone 1 is water surface at baseflow, Zone 2 is between baseflow surface and bankfull flow surface, Zone 3 is bankfull channel width above bankfull flow surface.
Meander Location: IM=inside meander, OM=outside meander, CO=crossover, SS=straight section
Habitat Association: PL=pool, RF=riffle, RN=run

LARGE WOODY DEBRIS CATEGORIES (≥10 cm small end diameter; ≥1.5 m length)				
Categories	1	2	3	4
Diameter Large End	0.1-<0.3m	0.3-0.6m	0.6-0.8m	>0.8m
Length	>1.5-5m	5-15m	>15m	-

Stream Shade and Canopy Cover Monitoring

Project Site ID:BVC04	Stream Name: Beaver Creek	Date: 8 JUL 2008

Section H

Site Name:BVC04							Date: 7/8/2008
Reach Length: 185 m				Transect Interval: 18.5 m			Initials: KS, LD
Transect	Left Bank	Center Upstream	Center Right	Center-downstream	Center Left	Right Bank	Comments:
1	0	0	0	0	0	8	RB = Shrubs
2	0	0	0	0	0	0	RB = Tree
3	2	0	0	0	0	1	RB = Tree
4	4	0	0	0	0	0	LB = Shrubs
5	8	0	0	0	0	4	LB = Shrubs
6	5	0	0	0	0	3	LB = Bank
7	13	0	0	0	0	3	LB = Bank RB = Shrub
8	8	0	0	0	0	9	LB = Bank
9	3	0	0	0	0	13	LB = Bank RB = Shrubs
10	11	0	0	0	0	11	LB = Forbs RB = Grass
11	12	16	2	0	9	12	LB, CU, CL = Bridge RB = Shrubs
Note: Cover in Transect 11 from bridge.							

Transect Data

Project Site ID: BVC04	Stream Name: Beaver Creek	Transect Number 1 of 11
Date: 7/8/08		
Habitat Type Along Transect (circle one): pool riffle [run]		

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	A	P
Bank Height (0.1 m)	2.1	2.8
Bank Angle (degrees)	14	57
Streambank length (0.1 m)	8.3	5.0
Length of Streambank Vegetated (0.1 m)	7.3	4.0
Length of Streambank Eroded (0.1 m)	0	1.0
Length of Streambank Deposition (0.1 m)	1.0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0.1	0.3
Undercut Bank (0.1 m)	0	0.3
Riparian landuse (circle one)	Cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify	cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify
Animal Vegetation Use (circle one)	none, [low], moderate, high	none, [low], moderate, high
Riparian Vegetation Type (Dominant)	sedge/rush, cottonwoods, [grass/forb], green ash, willows, silver maple, shrubs, other_____	sedge/rush, cottonwoods, grass/forb, green ash, willows, silver maple, [shrubs], other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout, young/sapling, mature, decadent, dead, [none]	seedling/sprout, young/sapling, mature, decadent, dead, [none]
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	*Juncus Sp.*	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0.4			
LBF	7.8	0.00		
LEW	9.3	0.58	0.00	
LCB	10.7	0.90	0.32	
STR (@1/4)	11.3	1.31	0.45	
STR (@1/2)	11.8	0.90	0.40	
STR (@3/4)	12.4	0.90	0.40	
RCB	13.3	1.60	0.39	
REW	13.6	0.81	0.35	
RBF	13.7	0.10		
RTB	16.5			

Location Codes:

LTB left top bank

RTB right top bank
LBF left bankfull
RBF right bankfull

LCB left channel bottom
RCB right channel bottom
LEW left edge water

REW right edge water
STR stream

Bank top width (RTB-LTB) = 16.1

Bankfull width (RBF-LBF)= 6.0

Channel Bottom Width (RCB-LCB)= 2.6

Stream Width (REW-LEW)= 4.3

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC04	Stream Name: Beaver Creek	Transect Number 2 of 11
Date: 7/11/08		
Habitat Type Along Transect (circle one): pool [riffle] run		

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	A	P
Bank Height (0.1 m)	2.2	2.3
Bank Angle (degrees)	**16**	27
Streambank length (0.1 m)	8.1	4.6
Length of Streambank Vegetated (0.1 m)	8.5	3.1
Length of Streambank Eroded (0.1 m)	0.5	1.0
Length of Streambank Deposition (0.1 m)	0	0.5
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0.1	0.1
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify	cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify
Animal Vegetation Use (circle one)	none, [low], moderate, high	none, [low], moderate, high
Riparian Vegetation Type (Dominant)	sedge/rush, cottonwoods, [grass/forb], green ash, willows, silver maple, shrubs, other_____	sedge/rush, cottonwoods, [grass/forb], green ash, willows, silver maple, shrubs, other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout, young/sapling, mature, decadent, dead, [not present]	seedling/sprout, young/sapling, mature, decadent, dead, [not present]
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	*Juncus Sp.*	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	1.0			
LBF	6.1	0.00		
LEW	8.5	0.25	0.00	
LCB	8.9	0.38	0.11	
STR (@1/4)	9.8	0.41	0.15	
STR (@1/2)	10.6	0.47	0.22	
STR (@3/4)	11.6	0.46	0.17	
RCB	12.0	0.47	0.12	
REW	13.1	0.38	0.00	
RBF	14.2	-0.02		
RTB	16.0			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) = 15.0

Bankfull width (RBF-LBF)= 8.2

Channel Bottom Width (RCB-LCB)= 3.1

Stream Width (REW-LEW)= 4.6

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC04	Stream Name: Beaver Creek	Transect Number
Date: 7/11/08		3 of 11
Habitat Type Along Transect (circle one): pool riffle [run]		

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	A	A
Bank Height (0.1 m)	2.7	2.4
Bank Angle (degrees)	30	25
Streambank length (0.1 m)	5.3	6.3
Length of Streambank Vegetated (0.1 m)	5.0	4.3
Length of Streambank Eroded (0.1 m)	0.3	1.0
Length of Streambank Deposition (0.1 m)	0	1.0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0.1	0.1
Undercut Bank (0.1 m)	0.2	0
Riparian landuse (circle one)	Cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / [low] / moderate / high	none / [low] / moderate / high
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout / young/sapling / mature / decadent / dead / [none]	seedling/sprout / young/sapling / mature / [decadent] / dead
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	*Juncus sp.*	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0.5			
LBF	4.0	0.00		
LEW	4.6	0.31	0.05	
LCB	5.1	0.69	0.31	
STR (@1/4)	6.2	0.58	0.29	
STR (@1/2)	7.6	0.44	0.19	
STR (@3/4)	9.0	0.45	0.15	
RCB	9.8	0.43	0.16	
REW	10.3	0.33	0.00	
RBF	12.6	-0.34		
RTB	15.5			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) = 15.0
Bankfull width (RBF-LBF) = 8.6
Channel Bottom Width (RCB-LCB) = 4.7
Stream Width (REW-LEW) = 5.7

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC04	Stream Name: Beaver Creek	Transect Number
Date: 7/11/08		4 of 11
Habitat Type Along Transect (circle one): pool [riffle] run		

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	P	A
Bank Height (0.1 m)	3.7	3.7
Bank Angle (degrees)	45	22
Streambank length (0.1 m)	4.7	7.3
Length of Streambank Vegetated (0.1 m)	1.0	7.30
Length of Streambank Eroded (0.1 m)	3.7	0
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0.2
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland, woodland/forested, [pasture/rangeland], barnyard, prairie, developed, wetland, other-specify, shrub	cropland, woodland/forested, [pasture/rangeland], barnyard, prairie, developed, wetland, other-specify, shrub
Animal Vegetation Use (circle one)	none, moderate, [low], high	none, moderate, [low], high
Riparian Vegetation Type (Dominant)	sedge/rush, willows, cottonwoods, silver maple, grass/forb, [shrubs], green ash, other_____	sedge/rush, willows, cottonwoods, silver maple, [grass/forb], shrubs, green ash, other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout, decadent, young/sapling, dead, mature, [none]	seedling/sprout, decadent, [young/sapling], dead, mature, none
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	*Juncus sp.*	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0.3			
LBF	3.0	0.0		
LEW	3.4	0.54	0.06	
LCB	3.7	0.74	0.31	
STR (@1/4)	4.6	0.79	0.36	
STR (@1/2)	6.4	0.63	0.12	
STR (@3/4)	8.4	0.71	0.21	
RCB	9.2	0.76	0.17	
REW	10.4	0.67	0.00	
RBF	11.1	0.05		
RTB	17.6			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) = 17.3

Bankfull width (RBF-LBF)= 8.1

Channel Bottom Width (RCB-LCB)= 5.5

Stream Width (REW-LEW)= 7.0

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC04	Stream Name: Beaver Creek	Transect Number
Date: 7/11/08		5 of 11
Habitat Type Along Transect (circle one): pool riffle [run]		

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	A	P
Bank Height (0.1 m)	3.5	3.2
Bank Angle (degrees)	55	21
Streambank length (0.1 m)	4.4	8.0
Length of Streambank Vegetated (0.1 m)	2.0	7.5
Length of Streambank Eroded (0.1 m)	2.4	0.5
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0.2
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / [low] / moderate / high	none / [low] / moderate / high
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout / young/sapling / mature / decadent / dead / [none]	seedling/sprout / [young/sapling] / mature / decadent / dead
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	*Juncus sp.*	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	0.7			
LBF	2.2	0.0		
LEW	3.0	0.50	0.00	
LCB	3.3	0.84	0.32	
STR (@1/4)	4.6	0.91	0.49	
STR (@1/2)	6.8	0.75	0.38	
STR (@3/4)	8.6	0.50	0.26	
RCB	9.8	0.48	0.21	
REW	10.7	0.40	0.00	
RBF	13.4	0.0		
RTB	17.7			

Location Codes:

LTB left top bank

RTB right top bank
LBF left bankfull
RBF right bankfull

LCB left channel bottom
RCB right channel bottom
LEW left edge water

REW right edge water
STR stream

Bank top width (RTB-LTB) = 17.0

Bankfull width (RBF-LBF)= 11.2

Channel Bottom Width (RCB-LCB)= 6.6

Stream Width (REW-LEW)= 7.7

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC04	Stream Name: Beaver Creek	Transect Number 6 of 11
Date: 7/11/08		
Habitat Type Along Transect (circle one): pool riffle run		

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	A	A
Bank Height (0.1 m)	3.7	3.9
Bank Angle (degrees)	53	40
Streambank length (0.1 m)	4.6	5.7
Length of Streambank Vegetated (0.1 m)	4.1	5.7
Length of Streambank Eroded (0.1 m)	0.5	0
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0.1	2.0
Undercut Bank (0.1 m)	0.1	0.3
Riparian landuse (circle one)	Cropland / pasture/rangeland / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / pasture/rangeland / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / low / moderate / high	none / low / moderate / high
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / grass/forb / green ash / willows / silver maple / shrubs / other_____	sedge/rush / cottonwoods / grass/forb / green ash / willows / silver maple / shrubs / other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout / young/sapling / mature / decadent / dead / none	seedling/sprout / young/sapling / mature / decadent / dead
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	*Juncus sp.*	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	8.0			
LBF	10.3	0		
LEW	11.0	0.52	0.06	
LCB	11.3	0.85	0.38	
STR (@1/4)	13.0	0.97	0.52	
STR (@1/2)	14.6	1.02	0.53	
STR (@3/4)	18.4	1.02	0.50	
RCB	20.0	1.07	0.45	
REW	20.9	0.67	0.00	
RBF	21.5	0.0		
RTB	25.5			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) = 17.5

Bankfull width (RBF-LBF)= 11.2

Channel Bottom Width (RCB-LCB)= 8.7

Stream Width (REW-LEW)= 9.9

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC04	Stream Name: Beaver Creek	Transect Number
Date: 7/11/08		7 of 11
Habitat Type Along Transect (circle one): pool [riffle] run		

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	A	P
Bank Height (0.1 m)	3.4	3.6
Bank Angle (degrees)	60	29
Streambank length (0.1 m)	3.9	8.0
Length of Streambank Vegetated (0.1 m)	0.1	8.0
Length of Streambank Eroded (0.1 m)	3.8	0
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0.3
Undercut Bank (0.1 m)	0	0.4
Riparian landuse (circle one)	Cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / [low] / moderate / high	none / [low] / moderate / high
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / shrubs / other_____	sedge/rush / cottonwoods / grass/forb / green ash / willows / silver maple / [shrubs] / other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout / young/sapling / mature / decadent / dead / [none]	seedling/sprout / young/sapling / mature / decadent / dead / [none]
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	*Juncus sp.*	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	13.0			
LBF	14.1	0.0		
LEW	14.5	0.68	0.00	
LCB	14.9	0.84	0.19	
STR (@1/4)	15.9	0.99	0.34	
STR (@1/2)	22.2	1.01	0.29	
STR (@3/4)	23.6	1.13	0.23	
RCB	24.4	1.11	0.33	
REW	24.6	1.17	0.30	
RBF	25.3	0.02		
RTB	31.0			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) = 18.0

Bankfull width (RBF-LBF) = 11.2

Channel Bottom Width (RCB-LCB) = 9.5

Stream Width (REW-LEW) = 10.1

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC04	Stream Name: Beaver Creek	Transect Number
Date: 7/11/08		8 of 11
Habitat Type Along Transect (circle one):	pool riffle run	

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	A	P
Bank Height (0.1 m)	3.2	3.3
Bank Angle (degrees)	55	30
Streambank length (0.1 m)	4.4	7.6
Length of Streambank Vegetated (0.1 m)	3.4	7.2
Length of Streambank Eroded (0.1 m)	1.0	0
Length of Streambank Deposition (0.1 m)	0	0.4
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0.1
Undercut Bank (0.1 m)	0	0
Riparian landuse (circle one)	Cropland, woodland/forested, [pasture/rangeland], barnyard, prairie, developed, wetland, other-specify, shrub	cropland, woodland/forested, [pasture/rangeland], barnyard, prairie, developed, wetland, other-specify, shrub
Animal Vegetation Use (circle one)	none, moderate, [low], high	none, moderate, [low], high
Riparian Vegetation Type (Dominant)	sedge/rush, willows, cottonwoods, silver maple, [grass/forb], shrubs, green ash, other_____	sedge/rush, willows, cottonwoods, silver maple, grass/forb, [shrubs], green ash, other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout, decadent, young/sapling, dead, mature, [none]	seedling/sprout, decadent, [young/sapling], dead, mature, none
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	*Juncus sp.*	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	1.0			
LBF	2.8	0.0		
LEW	3.1	1.05	0.00	
LCB	3.5	0.61	0.31	
STR (@1/4)	5.0	0.70	0.34	
STR (@1/2)	7.4	0.89	0.52	
STR (@3/4)	10.5	0.85	0.50	
RCB	11.7	0.70	0.27	
REW	12.5	0.60	0.11	
RBF	13.0	0.0		
RTB	18.0			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) =___17.0_____

Bankfull width (RBF-LBF)=___10.2____

Channel Bottom Width (RCB-LCB)=___ _8.2

Stream Width (REW-LEW)=__9.4___

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC04	Stream Name: Beaver Creek	Transect Number
Date: 7/8/08		9 of 11
Habitat Type Along Transect (circle one):	[pool] riffle run	

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	A	A
Bank Height (0.1 m)	3.8	3.7
Bank Angle (degrees)	40	26
Streambank length (0.1 m)	5.2	8.4
Length of Streambank Vegetated (0.1 m)	4.1	8.4
Length of Streambank Eroded (0.1 m)	1.1	0
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0.2
Undercut Bank (0.1 m)	0	0.1
Riparian landuse (circle one)	Cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / [low] / moderate / high	none / [low] / moderate / high
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / [grass/forb] / green ash / willows / silver maple / [shrubs] / other_____	sedge/rush / cottonwoods / grass/forb / green ash / willows / silver maple / shrubs / other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout / young/sapling / mature / decadent / dead / [none]	seedling/sprout / [young/sapling] / mature / decadent / dead
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	Juncus sp.	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	1.0			
LBF	3.5	0.0		
LEW	4.2	0.60	0.02	
LCB	4.3	1.05	0.42	
STR (@1/4)	7.2	0.90	0.44	
STR (@1/2)	9.3	1.02	0.55	
STR (@3/4)	11.2	1.10	0.40	
RCB	12.4	0.95	0.28	
REW	12.9	0.90	0.20	
RBF	13.1	0.0		
RTB	20.0			

Location Codes:

LTB left top bank
RTB right top bank
LBF left bankfull
RBF right bankfull
LCB left channel bottom
RCB right channel bottom
LEW left edge water
REW right edge water
STR stream

Bank top width (RTB-LTB) = 19.0

Bankfull width (RBF-LBF)= 9.6

Channel Bottom Width (RCB-LCB 8.1

Stream Width (REW-LEW)= 8.7

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC04	Stream Name: Beaver Creek	Transect Number
Date: 7/11/08		10 of 11
Habitat Type Along Transect (circle one):	[pool] riffle run	

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	A	A
Bank Height (0.1 m)	3.5	3.7
Bank Angle (degrees)	20.5	28
Streambank length (0.1 m)	3.0	40
Length of Streambank Vegetated (0.1 m)	10.7	6.8
Length of Streambank Eroded (0.1 m)	10.7	6.8
Length of Streambank Deposition (0.1 m)	0.8	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	0.2
Undercut Bank (0.1 m)	0	0.2
Riparian landuse (circle one)	Cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify	cropland, [pasture/rangeland], prairie, wetland, shrub, woodland/forested, barnyard, developed, other-specify
Animal Vegetation Use (circle one)	none, [low], moderate, high	none, [low], moderate, high
Riparian Vegetation Type (Dominant)	sedge/rush, cottonwoods, grass/forb, green ash, willows, silver maple, [shrubs], other_____	sedge/rush, cottonwoods, grass/forb, green ash, willows, silver maple, [shrubs], other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout, young/sapling, mature, decadent, dead, [none]	seedling/sprout, young/sapling, mature, decadent, dead, [none]
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	*Juncus sp.*	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	1.5			
LBF	9.9	0.0		
LEW	10.3	0.55	0.01	
LCB	11.5	0.82	0.31	
STR (@1/4)	12.5	0.85	0.36	
STR (@1/2)	14.3	0.95	0.41	
STR (@3/4)	16.3	1.04	0.38	
RCB	17.2	1.00	0.32	
REW	17.9	0.75	0.01	
RBF	18.3	0.0		
RTB	22.5			

Location Codes:

LTB left top bank

RTB right top bank
LBF left bankfull
RBF right bankfull

LCB left channel bottom
RCB right channel bottom
LEW left edge water

REW right edge water
STR stream

Bank top width (RTB-LTB) = 21.0

Bankfull width (RBF-LBF)= 8.4

Channel Bottom Width (RCB-LCB)= 5.7

Stream Width (REW-LEW)= 7.6

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

Transect Data

Project Site ID: BVC04	Stream Name: Beaver Creek	Transect Number 11 of 11
Date: 7/8/08		
Habitat Type Along Transect (circle one):	[pool] riffle run	

Section I

Streambank and Riparian Features	Left Bank	Right Bank
Bank Substrate (dominant)	Silt/Clay	Silt/Clay
Bank Slumpage (present, p or absent, a)	P	A
Bank Height (0.1 m)	3.2	3.8
Bank Angle (degrees)	35	37
Streambank length (0.1 m)	5.4	6.5
Length of Streambank Vegetated (0.1 m)	4.4	5.5
Length of Streambank Eroded (0.1 m)	1.0	1.0
Length of Streambank Deposition (0.1 m)	0	0
Riparian Buffer Width (m)	0	0
Overhanging Vegetation (0.1 m)	0	1.0
Undercut Bank (0.1 m)	0	0.1
Riparian landuse (circle one)	Cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify	cropland / [pasture/rangeland] / prairie / wetland / shrub / woodland/forested / barnyard / developed / other-specify
Animal Vegetation Use (circle one)	none / [low] / moderate / high	none / [low] / moderate / high
Riparian Vegetation Type (Dominant)	sedge/rush / cottonwoods / grass/forb / green ash / [willows] / silver maple / shrubs / other_____	sedge/rush / cottonwoods / grass/forb / green ash / willows / silver maple / shrubs / other_____
Riparian Age Class(es) of Trees, if present	seedling/sprout / [young/sapling] / mature / decadent / dead / none	seedling/sprout / [young/sapling] / mature / decadent / dead / none
Submergent Macrophytes (0.1 m)	0	
Emergent Macrophytes (0.1 m)	*Juncus sp.*	

Section J

Transect Data and Depth Velocity Data
(record units under the heading for each column)

Location Code	Station	Bankfull Depth	Water Depth	Velocity
LTB	5.0			
LBF	6.8	0.0		
LEW	8.6	0.78	0.01	
LCB	9.1	0.90	0.24	
STR (@1/4)	11.0	1.21	0.40	
STR (@1/2)	12.9	1.32	0.39	
STR (@3/4)	14.3	1.52	0.42	
RCB	15.8	1.50	0.28	
REW	16.2	1.31	0.14	
RBF	16.6	0.0		
RTB	20.9			

Location Codes:

LTB left top bank

RTB right top bank
LBF left bankfull
RBF right bankfull

LCB left channel bottom
RCB right channel bottom
LEW left edge water

REW right edge water
STR stream

Bank top width (RTB-LTB) = 15.9

Bankfull width (RBF-LBF)= 9.8

Channel Bottom Width (RCB-LCB)= 6.7

Stream Width (REW-LEW)= 7.7

* Bankfull Depth for LEW or REW should equal L(R)CB Bankfull Depth minus L(R)CB Water Depth.

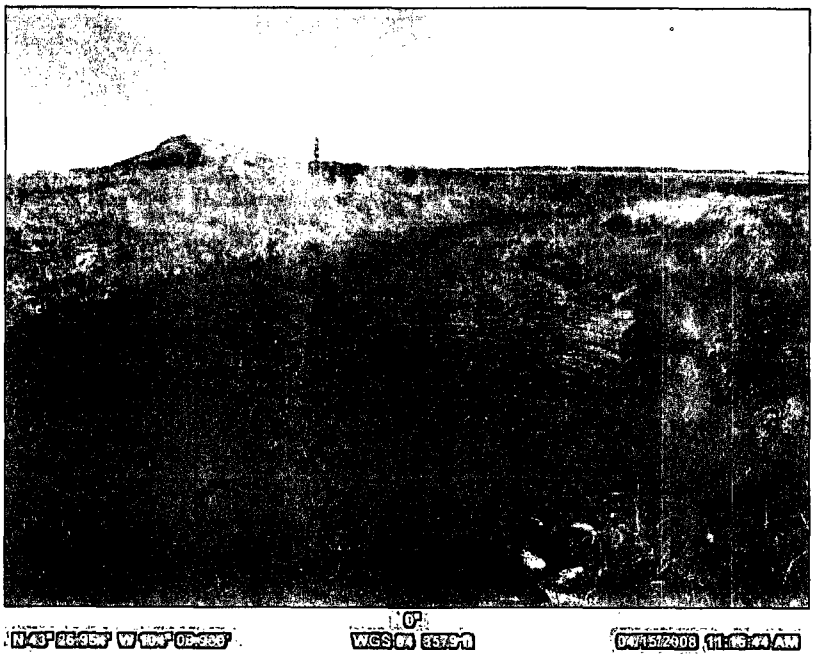


Photo 1. Site BVC01 looking upstream at Transect 1, April 15, 2008.



Photo 2. Site BVC01 looking upstream at Transect 2, April 15, 2008.



Photo 3. Site BVC01 looking upstream at Transect 3, April 15, 2008.



Photo 4. Site BVC01 looking upstream at Transect 4, April 15, 2008.



Photo 5. Site BVC01 looking upstream at Transect 5, April 15, 2008.



Photo 6. Site BVC01 f looking upstream at Transect 6, April 15, 2008.

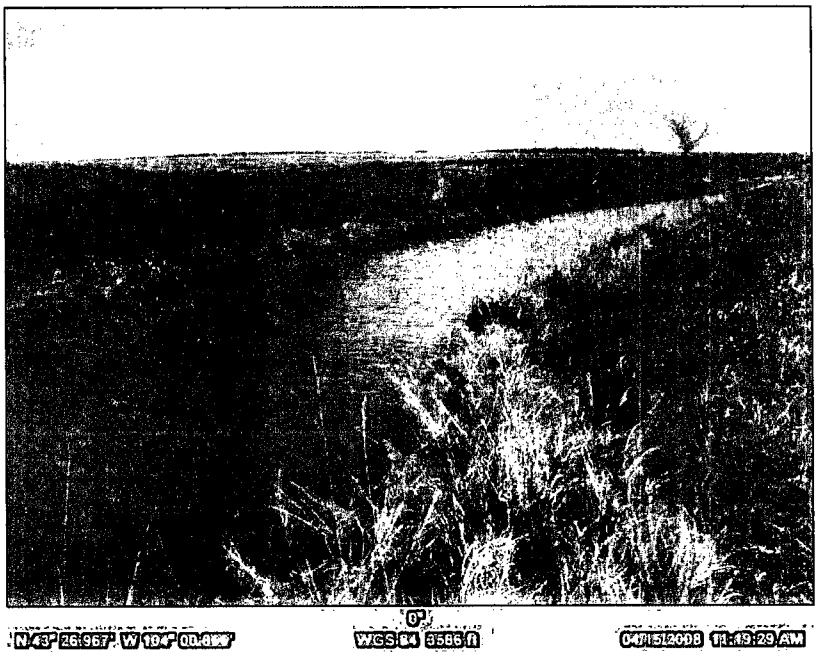


Photo 7. Site BVC01 looking upstream at Transect 7, April 15, 2008.

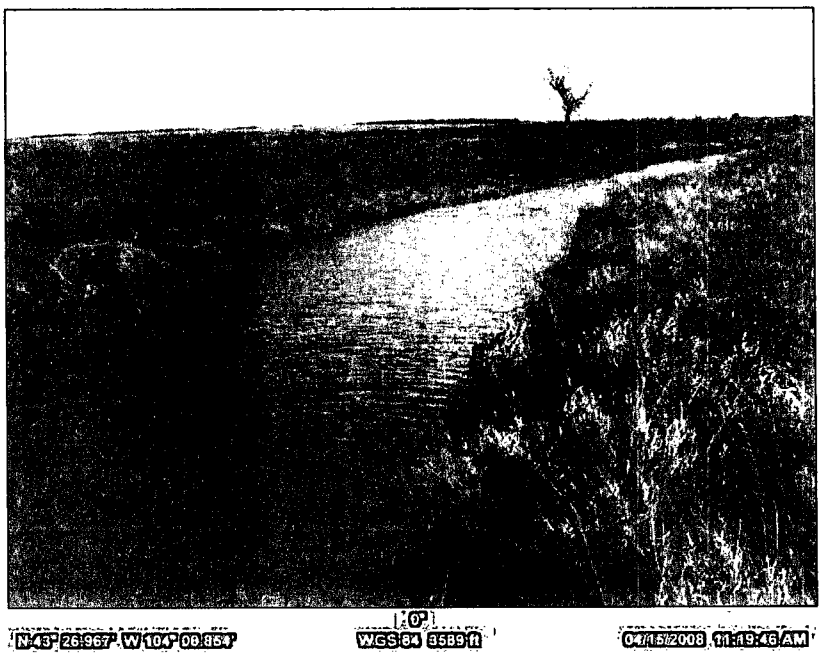


Photo 8. Site BVC01 looking upstream at Transect 8, April 15, 2008.



Photo 9. Site BVC01 looking upstream at Transect 9, April 15, 2008.

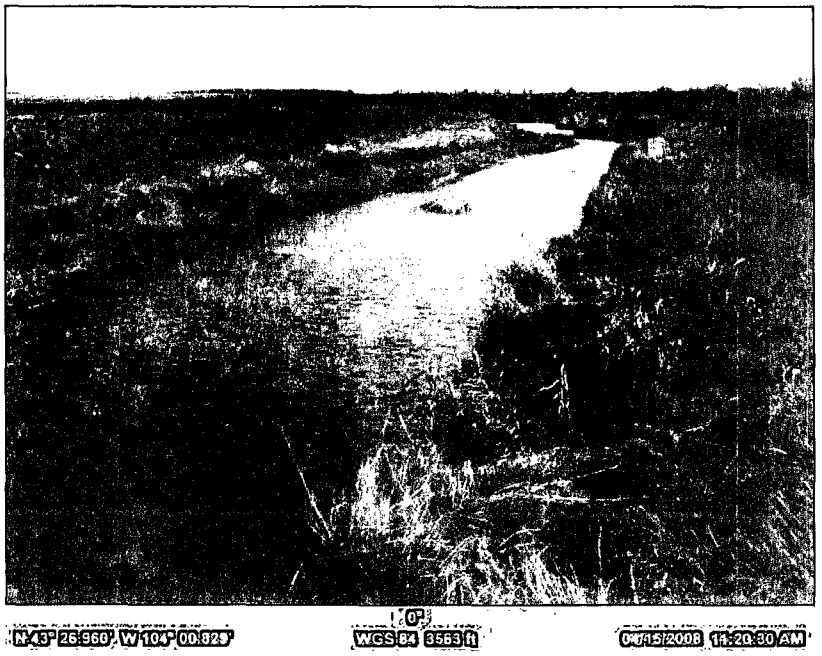


Photo 10. Site BVC01 looking upstream at Transect 10, April 15, 2008.



Photo 11. Site BVC01 looking upstream at Transect 11 April 15, 2008.



Photo 12. Site BVC01 looking upstream from Transect 11 April 15, 2008.

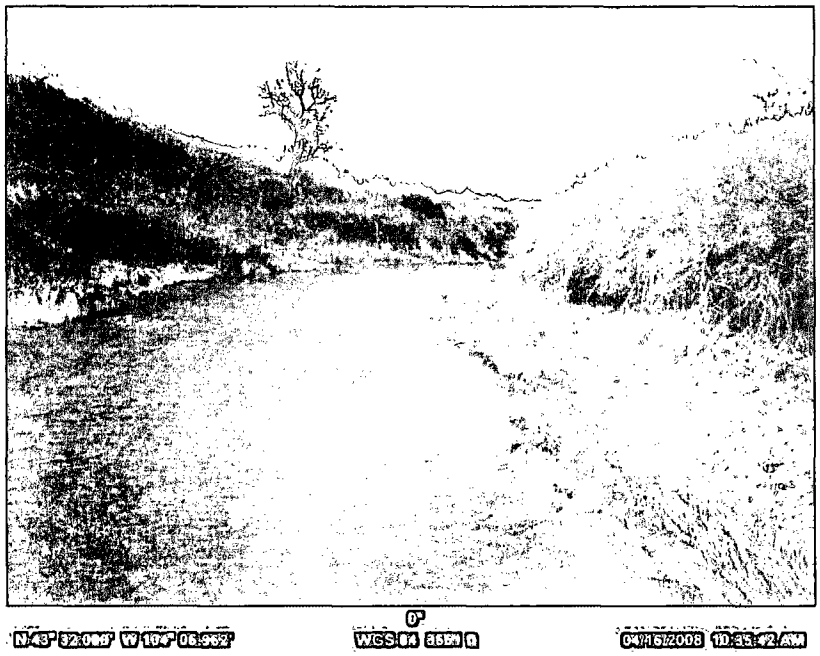


Photo 13. Site BVC04 looking upstream from Transect 1 April 16, 2008.



Photo 14. Site BVC04 looking upstream from Transect 2 April 16, 2008.



Photo 15. Site BVC04 looking upstream from Transect 3 April 16, 2008.



Photo 16. Site BVC04 looking upstream from Transect 4 April 16, 2008.

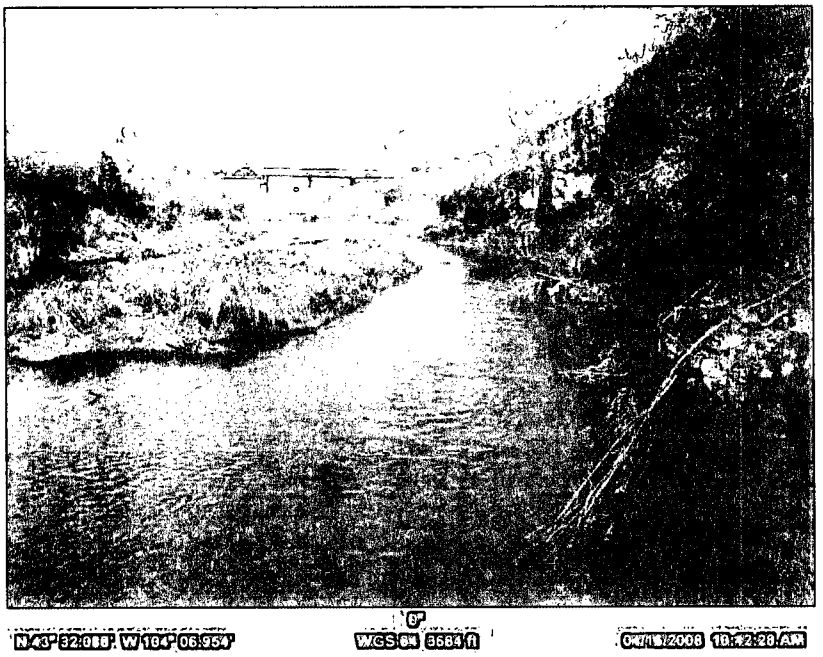


Photo 17. Site BVC04 looking upstream from Transcect 5 April 16, 2008.

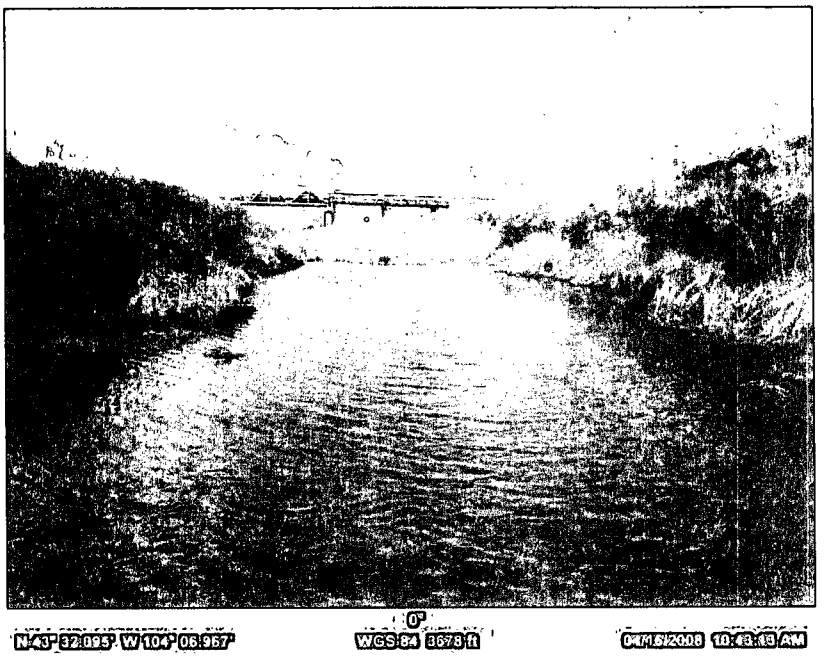


Photo 18. Site BVC04 looking upstream from Transect 6 April 16, 2008.

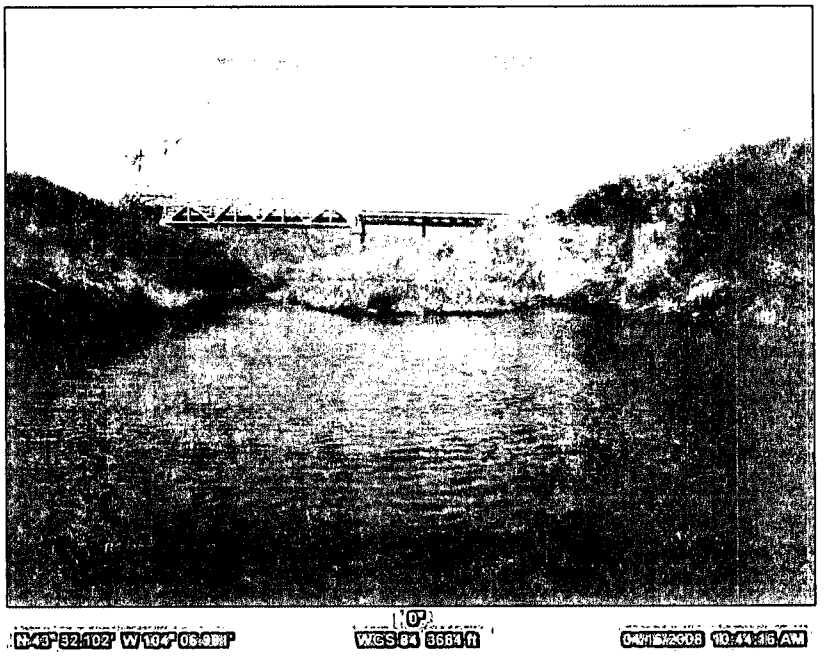


Photo 19. Site BVC04 looking upstream from Transect 7 April 16, 2008.

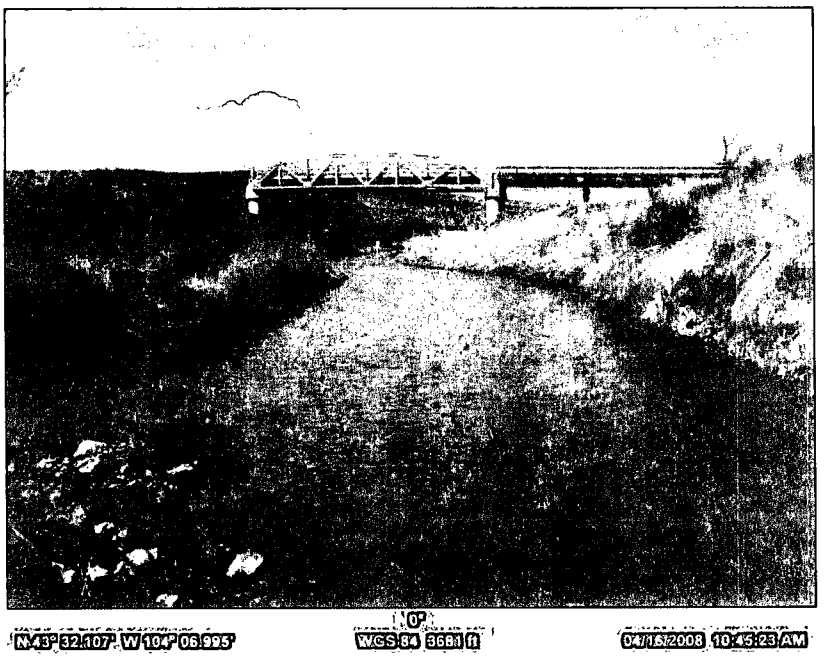


Photo 20. Site BVC04 looking upstream from Transect 8 April 16, 2008.

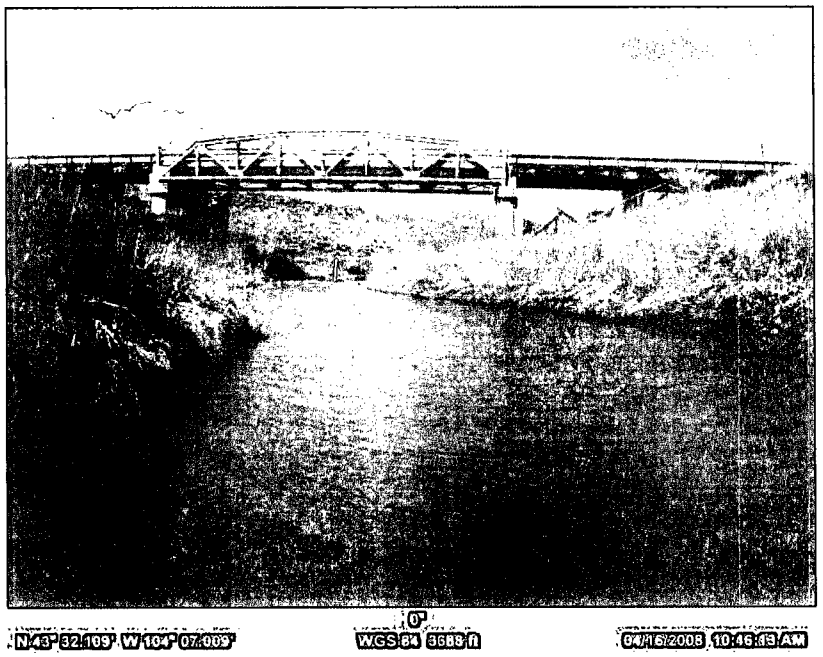


Photo 21. Site BVC04 looking upstream from Transect 9 April 16, 2008.

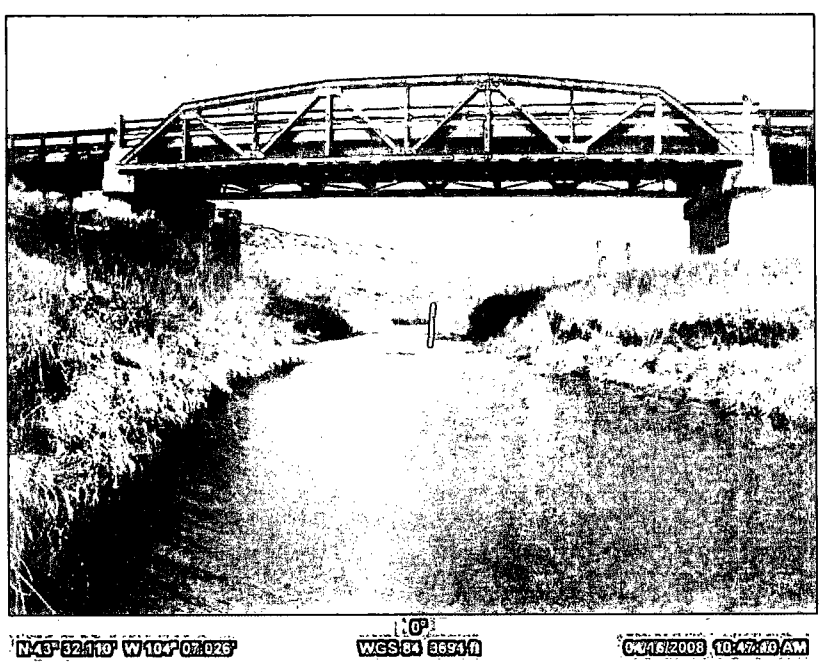


Photo 22. Site BVC04 looking upstream from Transect 10 April 16, 2008.

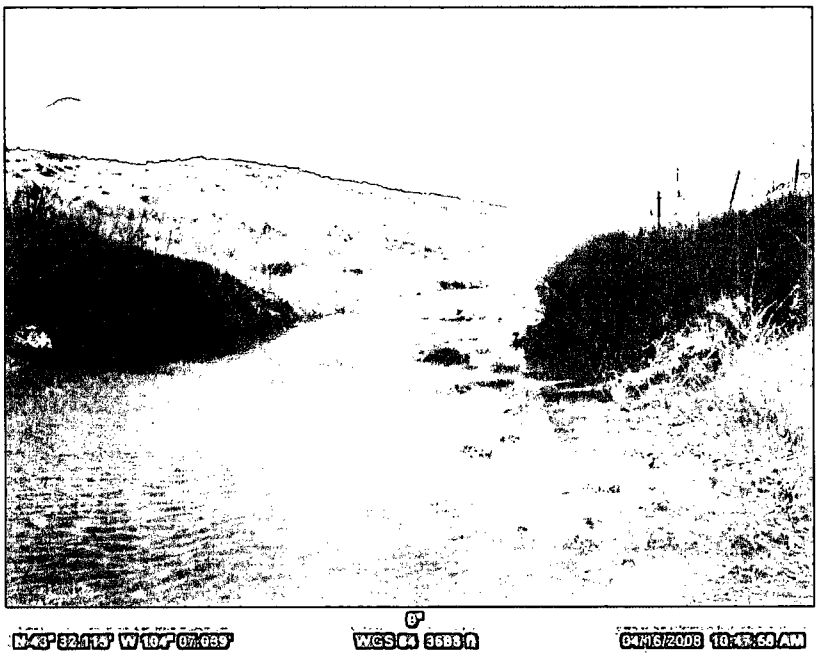


Photo 23. Site BVC04 looking upstream from Transect 11 April 16, 2008.



Photo 24. Site BVC01 looking upstream at Transect 1, July 9, 2008.



Photo 25. Site BVC01 looking upstream at Transect 2, July 9, 2008.

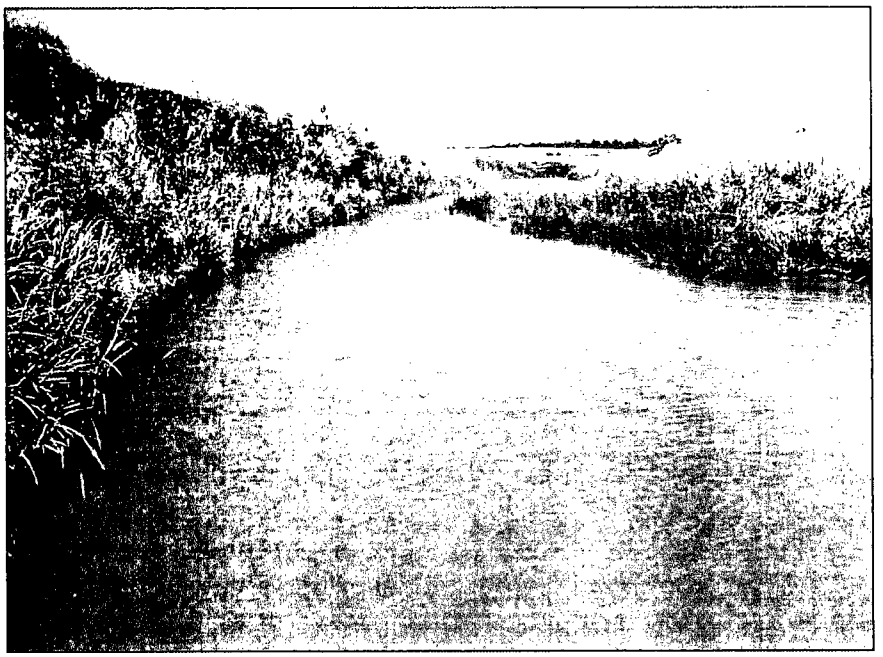


Photo 26. Site BVC01 looking upstream at Transect 3, July 9, 2008.

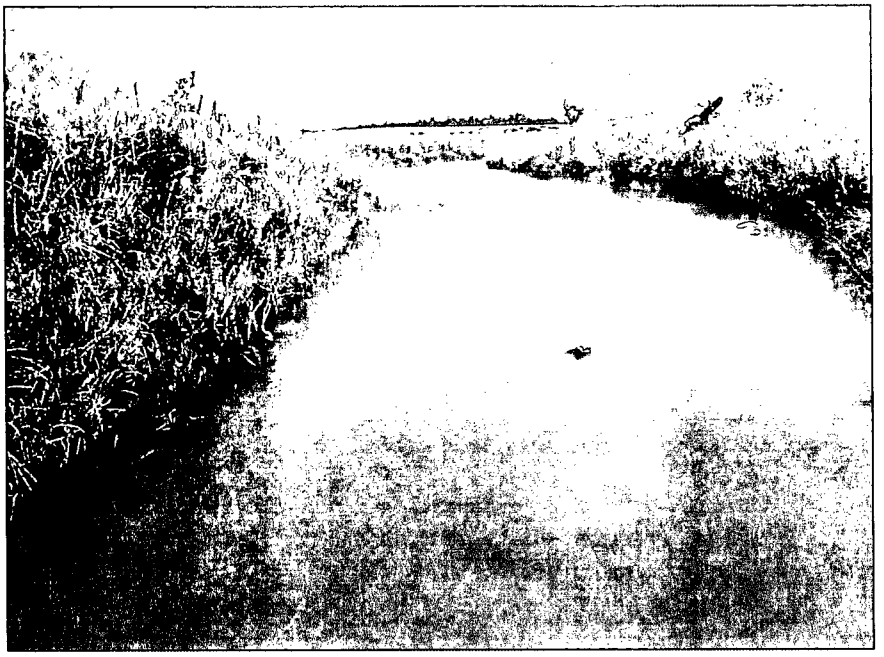


Photo 27. Site BVC01 looking upstream at Transect 4, July 9, 2008.



Photo 28. Site BVC01 looking upstream at Transect 5, July 9, 2008.

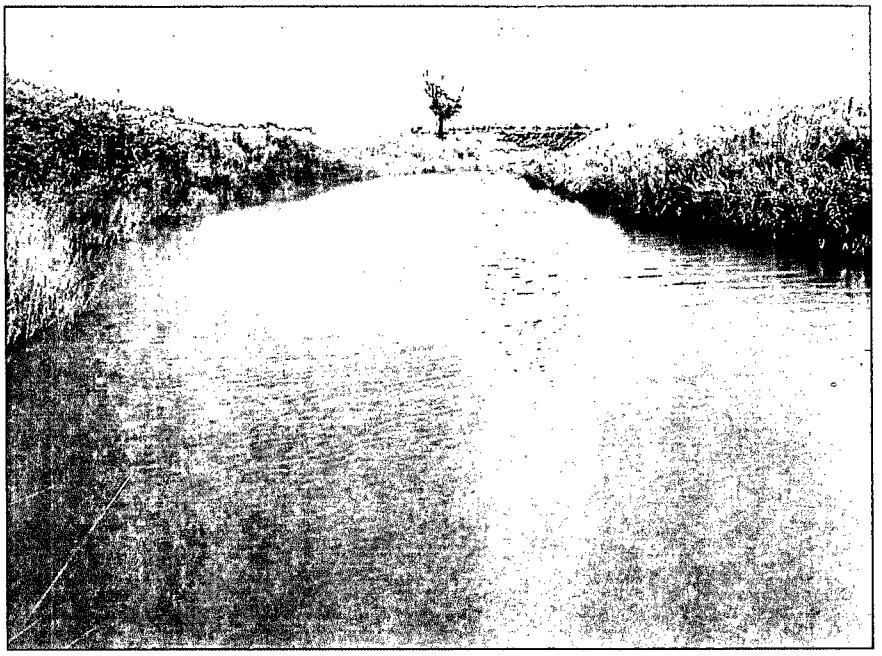


Photo 29. Site BVC01 f looking upstream at Transect 6, July 9, 2008.

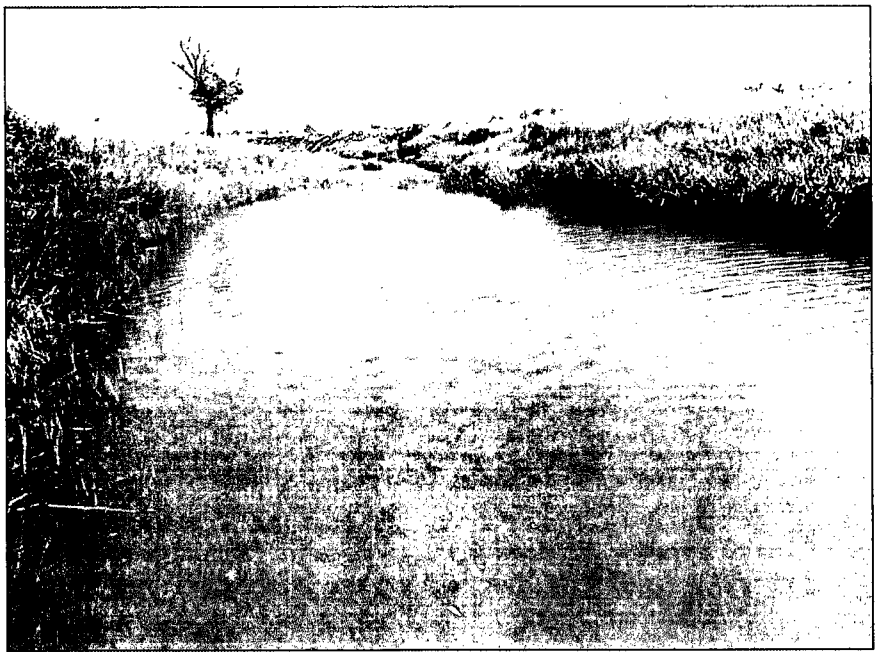


Photo 30. Site BVC01 looking upstream at Transect 7, July 9, 2008.

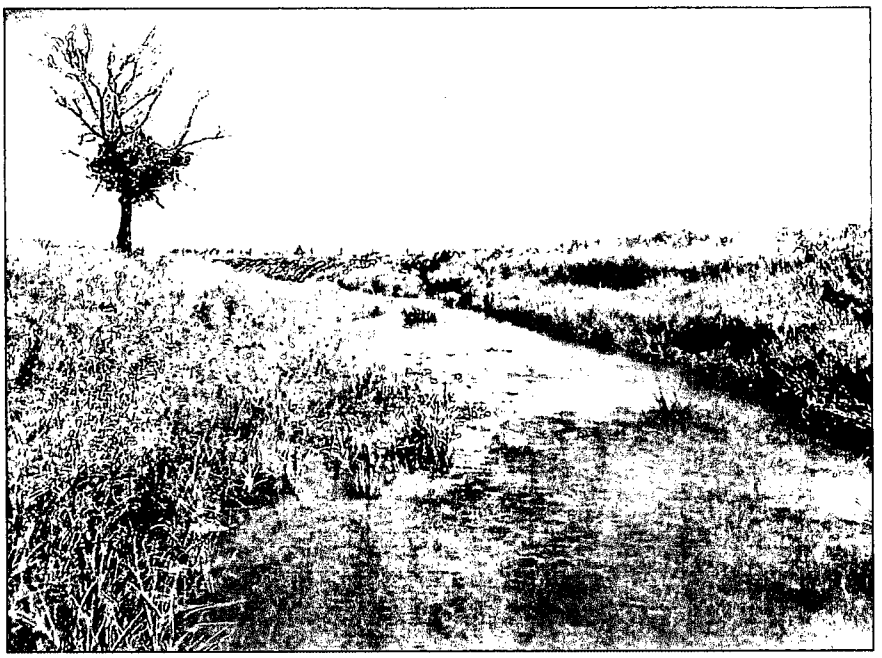


Photo 31. Site BVC01 looking upstream at Transect 8, July 9, 2008.

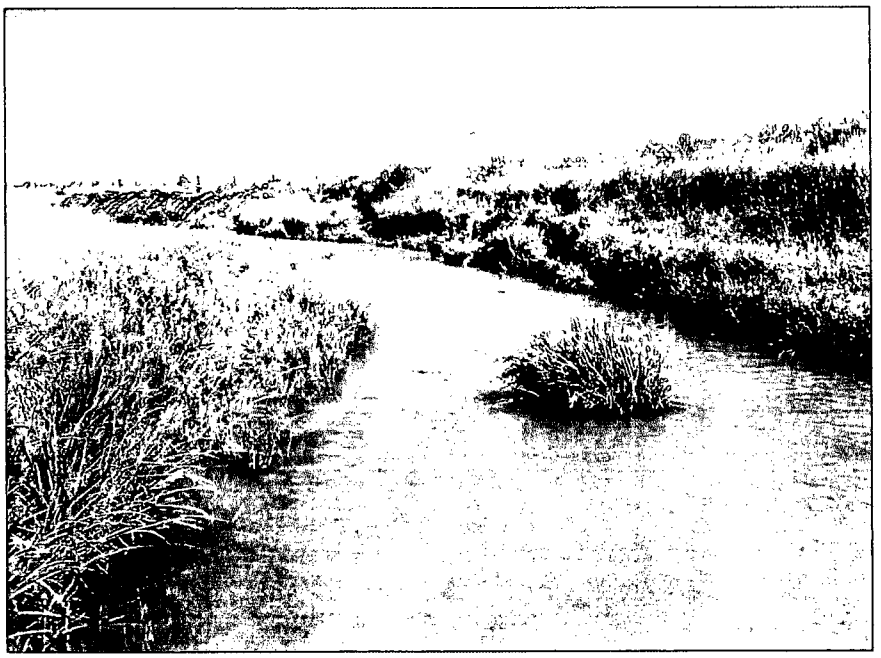


Photo 32. Site BVC01 looking upstream at Transect 9, July 9, 2008.



Photo 33. Site BVC01 looking upstream at Transect 10, July 9, 2008.

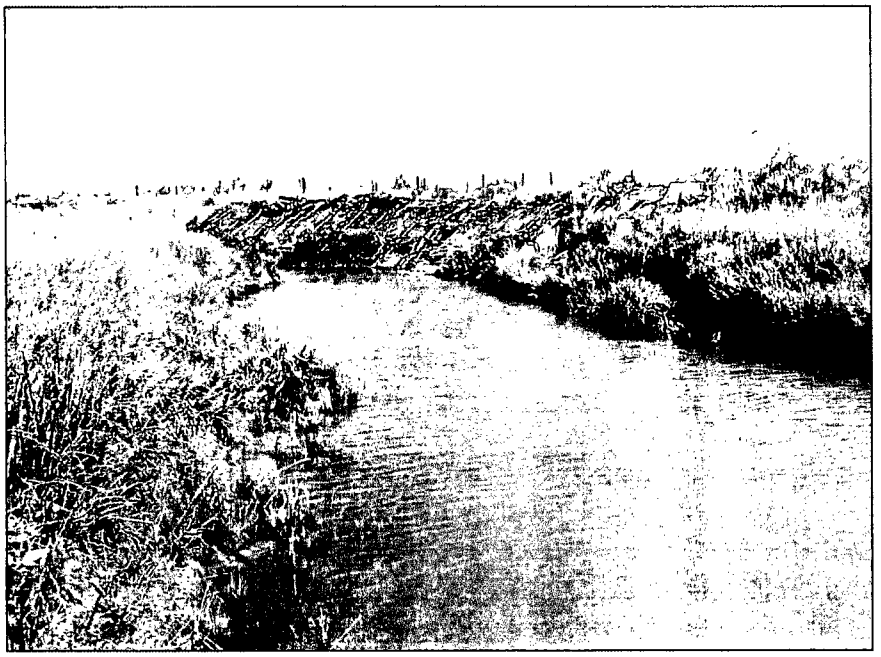


Photo 34. Site BVC01 looking upstream at Transect 11, July 9, 2008.



Photo 35. Site BVC04 looking upstream at Transect 1, July 8, 2008.

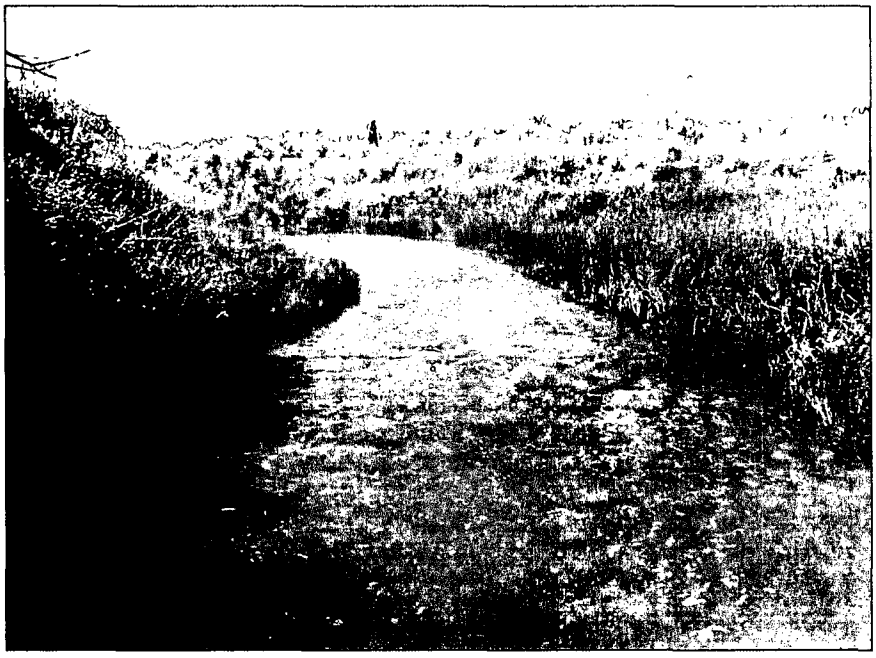


Photo 36. Site BVC04 looking upstream from Transect 1 July 8, 2008.



Photo 37. Site BVC04 looking upstream from Transect 2 July 8, 2008.

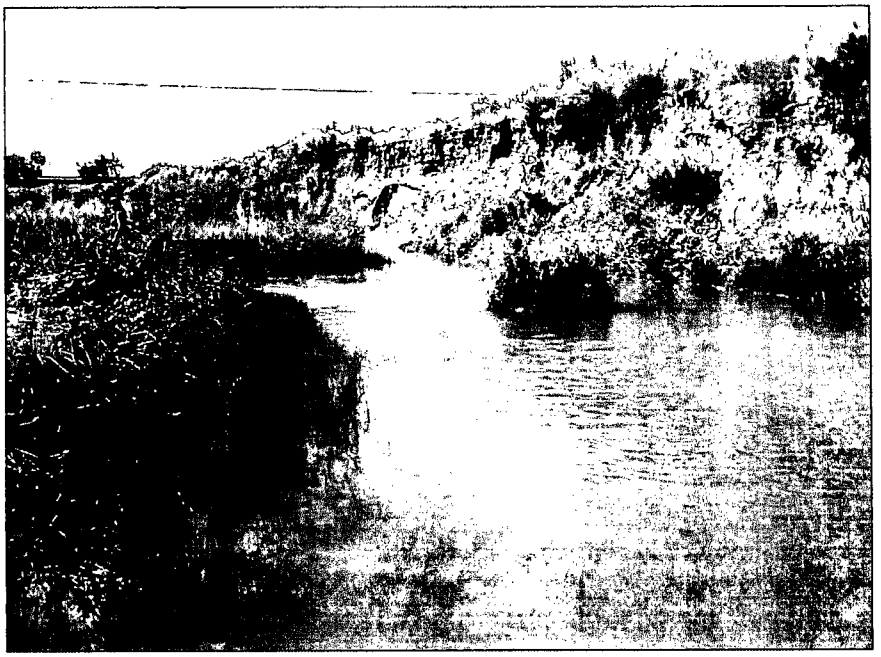


Photo 38. Site BVC04 looking upstream from Transect 3 July 8, 2008.

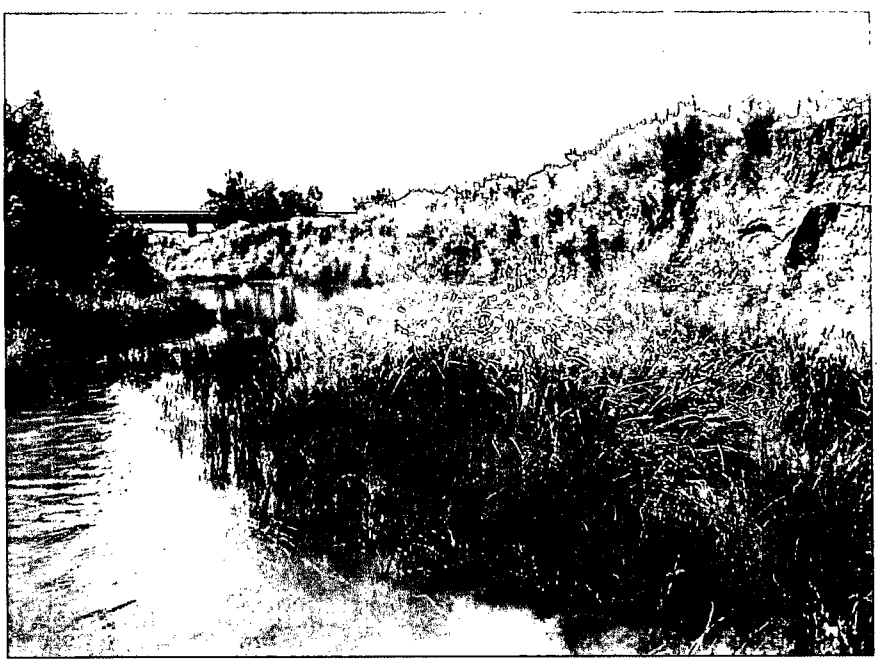


Photo 39. Site BVC04 looking upstream from Transect 4 July 8, 2008.

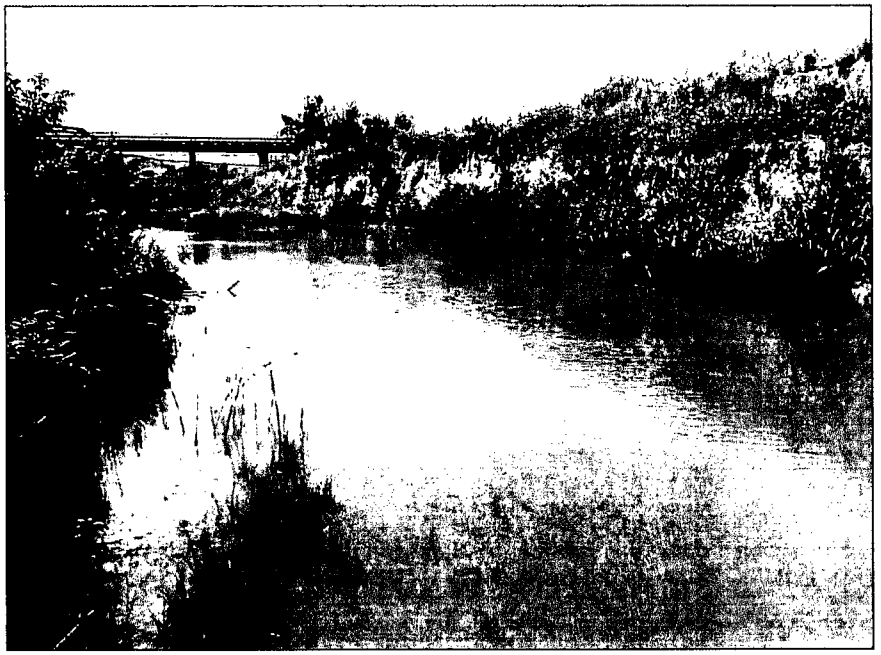


Photo 40. Site BVC04 looking upstream from Transect 5 July 8, 2008.



Photo 41. Site BVC04 looking upstream from Transect 6 July 8, 2008.

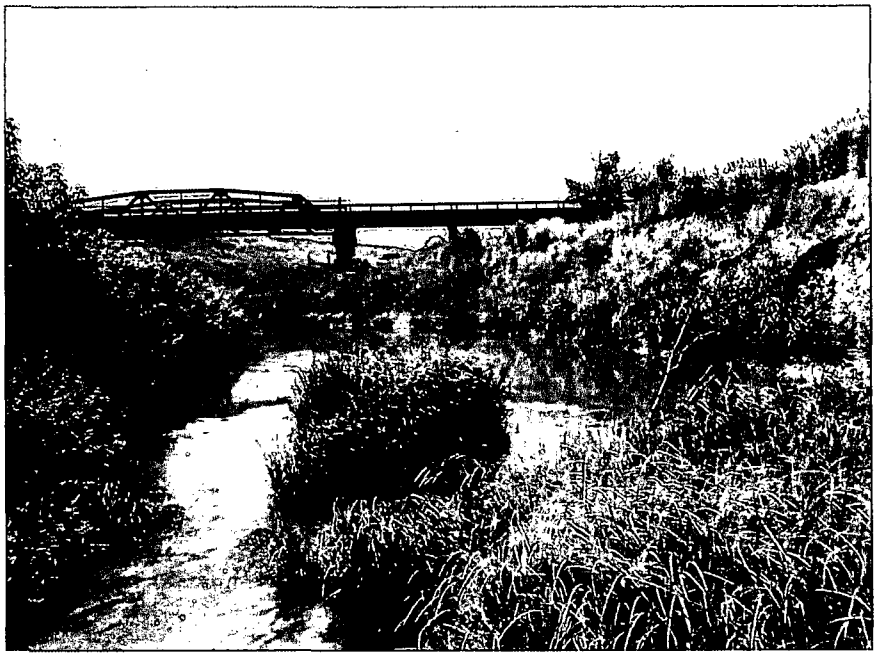


Photo 42. Site BVC04 looking upstream from Transect 7 July 8, 2008.



Photo 43. Site BVC04 looking upstream from Transect 8 July 8, 2008.

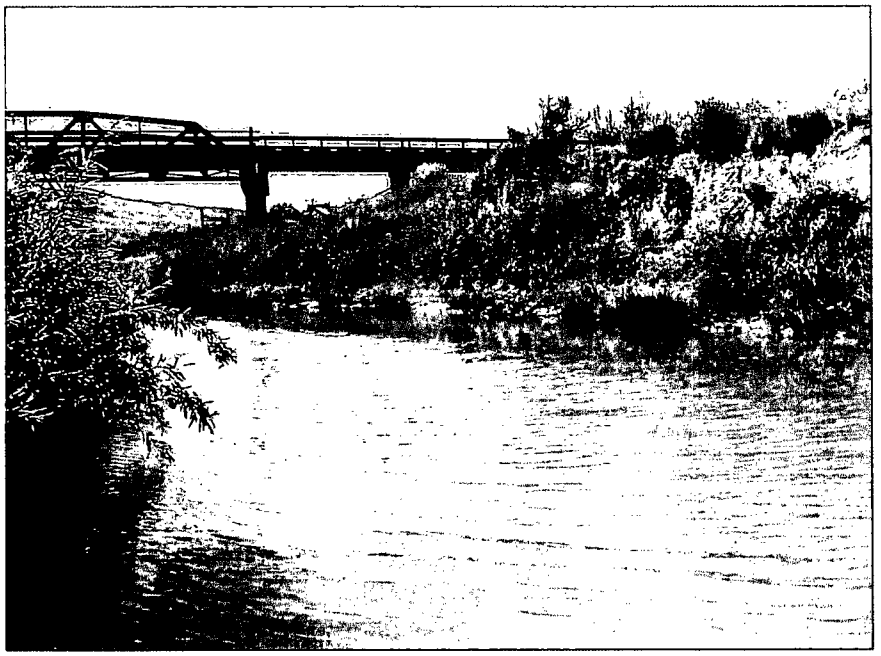


Photo 44. Site BVC04 looking upstream from Transect 9 July 8, 2008.

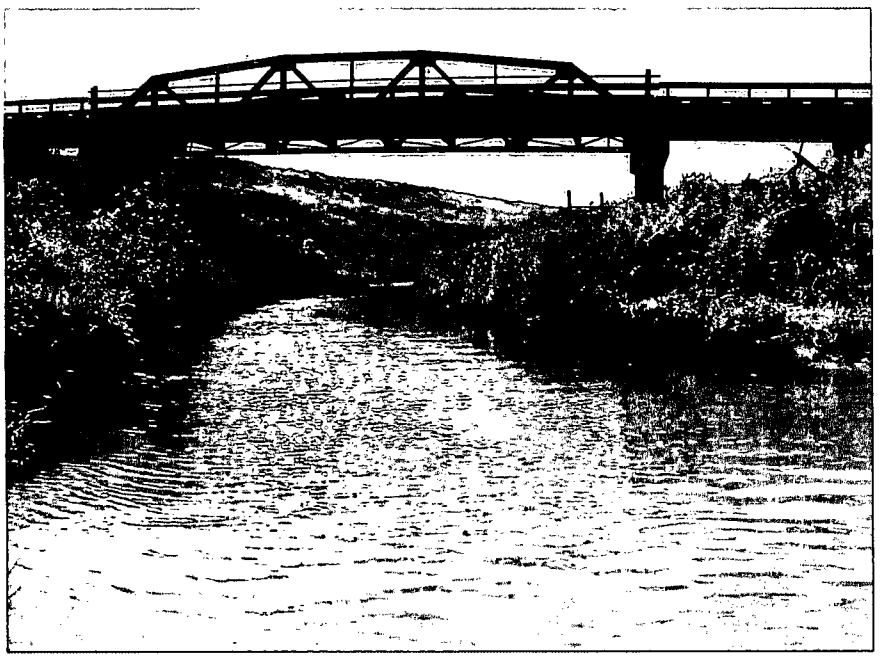


Photo 45. Site BVC04 looking upstream from Transect 10 July 8, 2008.



Photo 46. Site BVC04 looking upstream from Transect 11 July 8, 2008.



Photo 47. Site BVC04 looking downstream from Transect 11 July 8, 2008.

APPENDIX 3.5-K

FISH COLLECTION DATA FORMS

S. D. GAME FISH AND PARKS - STREAM SURVEY FIELD DATA SHEET
REVISED 2JUL2008

Stream Name: Beaver Creek

Site Number:

DATE (d d m m m y y): 16APR08

Site Description: BVC01 - Beaver Creek downstream

Site Length (meters): 100 S 09 R 01E T 07S

pH:

Cond. (umhos/cm): 7186

Temp.(C) air:

Water: 11.8

Dist. below top net (meters)	Stream Widths (meters)								
0	07.	45	0	05.	7				
10	07.	56	0	04.	8				
20	07.	67	0	05.	6				
30	07.	18	0	06.	5				
40	06.	69	0	06.	4				
100	06.	0	0	06.	3				

Smith-Roots
Mode:
Volts:

Personnel: A. Wones, K. Shook

#1		#2		#3		#4	
#5		#6		#7		#8	
Data		Scales		Lengths		Weights	

	Pass #1	Pass #2	Pass #3	Pass #4	Pass #5
Start time: (hhmm)					
End time: (hhmm)					
Smith-Root (seconds)					
Shocker #1					
Smith-Root (seconds)					
Shocker #2					
Smith-Root (seconds)					
Shocker #3					

Barge Shocker:

Range (H/L): Percent: Amps: . Pulse:

Pass	Start time (h h m m)	End time (h h m m)	Duration (seconds)	Anode #1	Anode #2	Anode #3
1						
2						
3						
4						
5						

REVISED 2JUL2008

Stream Name: Beaver Creek

Bulk Weights - (Record #5)

	(m m)			(m m)			Pass#	Species			Total Number			Total Weight		
Size Range:	2	9	to	0	6	4	1	F	H	M	0	6	4	0	8	1
Size Range:	4	1	to	4	8		1	P	L	K	0	0	2	0	0	8
Size Range:			to	1	2	0	1	G	R	S	0	0	1	0	2	5
Size Range:	4	8	to	0	4	8	1	L	N	D	0	0	1	0	0	<1
Size Range:			to													
Size Range:			to													
Size Range:			to													
Size Range:			to													
Size Range:			to													
Size Range:			to													

Digital Photos - Description

Top Blocking Net Looking Upstream 122

Top Blocking Net Looking Downstream

Bottom Blocking Net Looking Upstream 116

Bottom Blocking Net Looking Downstream

Upstream blocknet UTM: E 579651; N 4811171

Downstream blocknet UTM: E 579745; N 4811201

Video Camera

Tape #:				
Begin:				
End:				

	(d d m m m y y)	Personnel
Photos labeled:		
Photos filed:		

Comments: FHM = fathead minnow, GRS = Green Sunfish, LND = Long-Nosed Dace.
PLK = Plains Killifish.

DATA ENTRY - RECORD 2

	(d d m m m y y)	Personnel
Data Entry		
Verification:		

Field Q.C. by:

Batch Number:

DATA ENTRY - RECORD 3

	(d d m m m y y)	Personnel
Data Entry		
Verification:		

DATA ENTRY - RECORD 4

	(d d m m m y y)	Personnel
Data Entry		
Verification:		

DATA ENTRY - RECORD 5

	(d d m m m y y)	Personnel
Data Entry		
Verification:		

SOUTH DAKOTA GAME FISH AND PARKS 3305 WEST SOUTH STREET RAPID CITY, SD 57702

REVISED 2JUL2008

Stream Name Beaver Creek

Site Number BVC01

DATE dd-mmm-yy						
1	6	A	P	R	0	8

example 0 2 M A Y 9 2

Fish ID #	Pass #	Species Code	Total Length (mm)	Weight (grams)	Sca.	Mor.	Sex	Comments	Fish ID #	Pass #	Species Code	Total Length (mm)	Weight (grams)	Sca.	Mor.	Sex	Comments
1	1	FHM	030					Fathead Minnow	51	1	FHM	053					
2	1	FHM	048						52	1	FHM	040					
3	1	FHM	060						53	1	FHM	056					
4	1	FHM	062						54	1	FHM	049					
5	1	FHM	046						55	1	FHM	050					
6	1	FHM	050						56	1	FHM	030					
7	1	FHM	061						57	1	FHM	061					
8	1	FHM	059						58	1	FHM	036					
9	1	FHM	048						59	1	FHM	049					
10	1	FHM	052						60	1	FHM	053					
11	1	FHM	058						61	1	FHM	059					
12	1	FHM	043						62	1	FHM	038					
13	1	FHM	043						63	1	FHM	036					
14	1	FHM	059						64	1	FHM	042	0081				Combined Wt. For all FHM
15	1	FHM	059						65	1	PLK	041					Plains Killifish
16	1	FHM	062						66	1	PLK	048	0008				Combined Wt. For all PLK
17	1	FHM	041						67	1	GRS	120	0025				Green Sunfish
18	1	FHM	048						68	1	LND	048	<1				Long-Nosed Dace
19	1	FHM	056						69	1							
20	1	FHM	060						70	1							
21	1	FHM	050						71	1							
22	1	FHM	044						72	1							
23	1	FHM	045						73	1							
24	1	FHM	061						74	1							
25	1	FHM	054						75	1							
26	1	FHM	030						76	1							
27	1	FHM	059						77	1							
28	1	FHM	030						78	1							
29	1	FHM	055						79	1							
30	1	FHM	046						80	1							
31	1	FHM	050						81	1							
32	1	FHM	031						82	1							
33	1	FHM	052						83	1							
34	1	FHM	066						84	1							
35	1	FHM	056						85	1							
36	1	FHM	030						86	1							
37	1	FHM	032						87	1							
38	1	FHM	035						88	1							
39	1	FHM	030						89	1							
40	1	FHM	034						90	1							
41	1	FHM	059						91	1							
42	1	FHM	052						92	1							
43	1	FHM	057						93	1							
44	1	FHM	064						94	1							
45	1	FHM	058						95	1							
46	1	FHM	037						96	1							
47	1	FHM	029						97	1							
48	1	FHM	046						98	1							
49	1	FHM	035						99	1							
50	1	FHM	064						00	1							

S. D. GAME FISH AND PARKS - STREAM SURVEY FIELD DATA SHEET
REVISED 2JUL2008

Stream Name: Beaver Creek

Site Number:

Site Description: BVC04 - Upstream Site

DATE (d d m m m y y): 16APR08

Site Length (meters): 100 S R T

pH:
Cond. (umhos/cm): 5109
Temp.(C) air:
Water: 7.0

Dist. below top net (meters)	Stream Widths (meters)		
0		50	
10	10	46	4.2
20		70	
30	6	58	4.7
40	6	99	
		100	6.0

Smith-Roots
Mode:
Volts:

Personnel:

#1		#2		#3		#4	
#5		#6		#7		#8	
Data		Scales		Lengths		Weights	

	Pass #1	Pass #2	Pass #3	Pass #4	Pass #5
Start time: (hhmm)					
End time: (hhmm)					
Smith-Root (seconds)					
Shocker #1					
Smith-Root (seconds)					
Shocker #2					
Smith-Root (seconds)					
Shocker #3					

Barge Shocker:
Range (H/L): Percent: Amps: . Pulse:

Pass	Start time (h h m m)	End time (h h m m)	Duration (seconds)	Anode #1	Anode #2	Anode #3
1						
2						
3						
4						
5						

Stream Name: Beaver Creek

Bulk Weights - (Record #5)

	(m m)				(m m)			Pass#	Species			Total Number			Total Weight		
Size Range:	4	9	to	1	1	2		1	G	R	S	0	0	4	0	3	0
Size Range:		0	to	2	1	5		1	C	H	C	0	0	1	0	7	2
Size Range:			to					1	C	A	P			3		2	8
Size Range:	4	2	to	0	6	6		1	P	L	K	0	1	0	0	1	4
Size Range:	2	1	to	0	6	6		1	F	H	M		8	4	0	9	2
Size Range:			to														
Size Range:			to														
Size Range:			to														
Size Range:			to														
Size Range:			to														

Digital Photos - Description

Top Blocking Net Looking Upstream

Top Blocking Net Looking Downstream

Bottom Blocking Net Looking Upstream

Bottom Blocking Net Looking Downstream

Upstream Blocknet E 571380 N 4820615

Downstream blocknet E 571444 N4820551

Video Camera

Tape #:

Begin:

End:

	(d d m m m y y)	Personnel
Photos labeled:		
Photos filed:		

Comments: GRS=Green Sunfish, CHC= Channel Catfish, PLK= Plains Killifish, FHM= Fathead Minnow CAP= CARP

Water temp 7.0 C at 11:28 and 16.03 at 18:43; Turbidity 11.8, DO 9.20

DATA ENTRY - RECORD 2

	(d d m m m y y)	Personnel
Data Entry:		
Verification:		

Field Q.C. by: A. Wones

Batch Number:

DATA ENTRY - RECORD 3

	(d d m m m y y)	Personnel
Data Entry:		
Verification:		

DATA ENTRY - RECORD 4

	(d d m m m y y)	Personnel
Data Entry		
Verification:		

DATA ENTRY - RECORD 5

	(d d m m m y y)	Personnel
Data Entry		
Verification:		

SOUTH DAKOTA GAME FISH AND PARKS 3305 WEST SOUTH STREET RAPID CITY, SD 57702

REVISED 2JULY, 2008

Stream Name Beaver Creek

Site Number BVC04

DATE dd-mmm-yy						
1	6	A	P	R	0	8

example 0 2 M A Y 9 2

Fish ID #	Pass #	Species Code	Total Length (mm)	Weight (grams)	Sca.	Mor.	Sex	Comments	Fish ID #	Pass #	Species Code	Total Length (mm)	Weight (grams)	Sca.	Mor.	Sex	Comments
1	1	GRS	112	0025				Green Sunfish	51	1	FHM	045					
2	1	GRS	050						52	1	FHM	047					
3	1	GRS	049						53	1	FHM	031					
4	1	GRS	053	0030				Comb. Wt	54	1	FHM	048					
5	1	CHC	215	0072				Channel Catfish	55	1	FHM	055					
6	1	PLK	04					Plains Killifish	56	1	FHM	040					
7	1	PLK	06						57	1	FHM	045					
8	1	PLK	04					Comb. Wt	58	1	FHM	046					
9	1	PLK	05						59	1	FHM	035					
10	1	PLK	04						60	1	FHM	045					
11	1	PLK	04						61	1	FHM	054					
12	1	PLK	04						62	1	FHM	039					
13	1	PLK	05						63	1	FHM	043					
14	1	PLK	04						64	1	FHM	031					
15	1	PLK	04						65	1	FHM	058					
16	1	CAP	111	0021				Carp	66	1	FHM	056					
17	1	CAP	062					Comb. Wt of #17,18=7g	67	1	FHM	047					
18	1	CAP	053	7				Comb. Wt	68	1	FHM	053					
19	1	FHM	052					Fathead Minnow	69	1	FHM	032					
20	1	FHM	041	92				Comb. Wt .	70	1	FHM	038					
21	1	FHM	042						71	1	FHM	041					
22	1	FHM	054						72	1	FHM	039					
23	1	FHM	035						73	1	FHM	051					
24	1	FHM	037						74	1	FHM	044					
25	1	FHM	041						75	1	FHM	038					
26	1	FHM	043						76	1	FHM	057					
27	1	FHM	036						77	1	FHM	050					
28	1	FHM	033						78	1	FHM	041					
29	1	FHM	044						79	1	FHM	044					
30	1	FHM	046						80	1	FHM	057					
31	1	FHM	052						81	1	FHM	045					
32	1	FHM	036						82	1	FHM	047					
33	1	FHM	050						83	1	FHM	043					
34	1	FHM	039						84	1	FHM	045					
35	1	FHM	057						85	1	FHM	046					
36	1	FHM	036						86	1	FHM	052					
37	1	FHM	033						87	1	FHM	047					
38	1	FHM	039						88	1	FHM	040					
39	1	FHM	065						89	1	FHM	048					
40	1	FHM	043						90	1	FHM	045					
41	1	FHM	060						91	1	FHM	047					
42	1	FHM	021						92	1	FHM	041					
43	1	FHM	040						93	1	FHM	045					
44	1	FHM	030						94	1	FHM	035					
45	1	FHM	039						95	1	FHM	039					
46	1	FHM	056						96	1	FHM	047					
47	1	FHM	054						97	1	FHM	058					
48	1	FHM	063						98	1	FHM	047					
49	1	FHM	049						99	1	FHM	031					
50	1	FHM	066						00	1	FHM	027					

S. D. GAME FISH AND PARKS - STREAM SURVEY FIELD DATA SHEET
REVISED 2JUL2008

Stream Name: Cheyenne River

Site Number:

DATE (d d m m m y y): 15 APR 08

Site Description: Site CHR05 - Cheyenne River at Marietta

Site Length (meters): 100 S 06 R 02E T 39N

		Dist. below top net (meters)	Stream Widths (meters)	
pH:				Smith-Roots
Cond. (umhos/cm):				Mode:
Temp.(C) air:		0	.5 0	Volts:
Water:	15.0	10	.6 0	
		20	.7 0	
		30	.8 0	
		40	.9 0	
			100	

Personnel:

#1		#2		#3		#4	
#5		#6		#7		#8	
Data		Scales		Lengths		Weights	

	Pass #1	Pass #2	Pass #3	Pass #4	Pass #5
Start time: (hhmm)					
End time: (hhmm)					
Smith-Root (seconds)					
Shocker #1					
Smith-Root (seconds)					
Shocker #2					
Smith-Root (seconds)					
Shocker #3					

Barge Shocker:

Range (H/L): Percent: Amps: . Pulse:

Pass	Start time (h h m m)	End time (h h m m)	Duration (seconds)	Anode #1	Anode #2	Anode #3
1						
2						
3						
4						
5						

REVISED 2JUL2008

Stream Name: Cheyenne River

Bulk Weights - (Record #5)

	(m m)			(m m)		Pass#	Species		Total Number			Total Weight		
Size Range:	9	7	to	0	9	7		R	I	C	0	0	1	0	1	3
Size Range:	9	8	to	0	9	8		G	R	S	0	0	1	0	2	0
Size Range:	3	2	to	0	7	4		P	L	K	0	4	8	0	6	9
Size Range:	8	2	to	2	2	0		S	R	S	0	1	4	6	1	2
Size Range:	5	1	to	0	5	1		P	T	M	0	0	1	0	0	<1
Size Range:	3	1	to	0	6	7		S	A	S	0	3	8	0	5	3
Size Range:	2	5	to	0	8	8		C	R	C	1	0	0	0	9	1
Size Range:			to													
Size Range:			to													
Size Range:			to													

Digital Photos - Description

Top Blocking Net Looking Upstream

Top Blocking Net Looking Downstream

Bottom Blocking Net Looking Upstream

Bottom Blocking Net Looking Downstream

Upstream blocknet at UTM E0587455 N4804678

Downstream blocknet at UTM E0587538 N4804736

Video Camera

Tape #:

Begin:

End:

	(d d m m m y y)	Personnel
Photos labeled:		
Photos filed:		

Comments: RIC= River Carpsucker; GRS = Green Sunfish; PLK = Plains kilifish; SRS = Shorthead Redhorse Sucker; PTM = Plains Topminnow; SAS = Sand Shiner; CRC = Creek Chub.

DATA ENTRY - RECORD 2

	(d d m m m y y)	Personnel
Data Entry:		
Verification:		

Field Q.C. by: A. Wones

Batch Number:

DATA ENTRY - RECORD 3

	(d d m m m y y)	Personnel
Data Entry:		
Verification:		

DATA ENTRY - RECORD 4

	(d d m m m y y)	Personnel
Data Entry:		
Verification:		

DATA ENTRY - RECORD 5

	(d d m m m y y)	Personnel
Data Entry:		
Verification:		

SOUTH DAKOTA GAME FISH AND PARKS 3305 WEST SOUTH STREET RAPID CITY, SD 57702

Revised: 08JUL08

Stream Name Cheyenne River

Site Number CHR05

DATE dd-mmm-yy	
15APR08	

example 02MAY92

Fish ID #	Pass #	Species Code	Total Length (mm)	Weight (grams)	Sca.	Mor.	Sex	Comments
1	1	CRC	039					Creek Chu
2	1	CRC	068	091				Combined wt =
3	1	CRC	049					
4	1	CRC	050					
5	1	CRC	061					
6	1	CRC	045					
7	1	CRC	075					
8	1	CRC	039					
9	1	CRC	046					
10	1	CRC	038					
11	1	CRC	041					
12	1	CRC	035					
13	1	CRC	035					
14	1	CRC	058					
15	1	CRC	043					
16	1	CRC	040					
17	1	CRC	040					
18	1	CRC	060					
19	1	CRC	049					
20	1	CRC	037					
21	1	CRC	041					
22	1	CRC	033					
23	1	CRC	032					
24	1	CRC	052					
25	1	CRC	031					
26	1	CRC	026					
27	1	CRC	050					
28	1	CRC	046					
29	1	CRC	054					
30	1	CRC	045					
31	1	CRC	052					
32	1	CRC	033					
33	1	CRC	030					
34	1	CRC	050					
35	1	CRC	035					
36	1	CRC	071					
37	1	CRC	048					
38	1	CRC	066					
39	1	CRC	044					
40	1	CRC	041					
41	1	CRC	040					
42	1	CRC	039					
43	1	CRC	036					
44	1	CRC	070					
45	1	CRC	051					
46	1	CRC	042					
47	1	CRC	088					
48	1	CRC	036					
49	1	CRC	077					
50	1	CRC	075					
51	1	CRC	044					
52	1	CRC	042					
53	1	CRC	045					
54	1	CRC	077					
55	1	CRC	037					
56	1	CRC	048					
57	1	CRC	041					
58	1	CRC	074					
59	1	CRC	037					
60	1	CRC	038					
61	1	CRC	039					
62	1	CRC	040					
63	1	CRC	025					
64	1	CRC	042					
65	1	CRC	030					
66	1	CRC	052					
67	1	CRC	030					
68	1	CRC	058					
69	1	CRC	043					
70	1	CRC	060					
71	1	CRC	062					
72	1	CRC	052					
73	1	CRC	041					
74	1	CRC	058					
75	1	CRC	044					
76	1	CRC	041					
77	1	CRC	040					
78	1	CRC	042					
79	1	CRC	060					
80	1	CRC	038					
81	1	CRC	070					
82	1	CRC	057					
83	1	CRC	049					
84	1	CRC	047					
85	1	CRC	059					
86	1	CRC	059					
87	1	CRC	038					
88	1	CRC	058					
89	1	CRC	040					
90	1	CRC	032					
91	1	CRC	037					
92	1	CRC	036					
93	1	CRC	047					
94	1	CRC	041					
95	1	CRC	056					
96	1	CRC	048					
97	1	CRC	050					
98	1	CRC	040					
99	1	CRC	040					
00	1	CRC	045					

SOUTH DAKOTA GAME FISH AND PARKS 3305 WEST SOUTH STREET RAPID CITY, SD 57702

Revised: 2JUL08

Stream Name Cheyenne River

Site Number CHR05

DATE dd-mmm-yy: 15APR08

example 02MAY92

Fish ID #	Pass #	Species Code	Total Length (mm)	Weight (grams)	Sca.	Mor.	Sex	Comments
1	1	RIC	097	0013				likely River carpsucker
2	1	GRS	098	0020				Green sunfish
3	1	PLK	058					Plains killifish.
4	1	PLK	065	0069				Combined wt
5	1	PLK	035					
6	1	PLK	057					
7	1	PLK	039					
8	1	PLK	070					
9	1	PLK	042					
10	1	PLK	072					
11	1	PLK	046					
12	1	PLK	036					
13	1	PLK	044					
14	1	PLK	052					
15	1	PLK	065					
16	1	PLK	040					
17	1	PLK	067					
18	1	PLK	068					
19	1	PLK	052					
20	1	PLK	060					
21	1	PLK	060					
22	1	PLK	074					
23	1	PLK	048					
24	1	PLK	041					
25	1	PLK	040					
26	1	PLK	032					
27	1	PLK	064					
28	1	PLK	057					
29	1	PLK	040					
30	1	PLK	043					
31	1	PLK	053					
32	1	PLK	068					
33	1	PLK	037					
34	1	PLK	042					
35	1	PLK	034					
36	1	PLK	046					
37	1	PLK	036					
38	1	PLK	040					
39	1	PLK	049					
40	1	PLK	048					
41	1	PLK	060					
42	1	PLK	041					
43	1	PLK	032					
44	1	PLK	051					
45	1	PLK	038					
46	1	PLK	040					
47	1	PLK	060					
48	1	PLK	045					
49	1	PLK	036					
50	1	PLK	044					
51	1	SRS	174	0072				Shorthead redhorse sucker
52	1	SRS	220	0122				
53	1	SRS	201	1000				
54	1	SRS	197	0094				
55	1	SRS	178	0080				
56	1	SRS	169	0054				
57	1	SRS	110	0007				
58	1	SRS	084	0005				
59	1	SRS	085	0003				
60	1	SRS	195	0098				
61	1	SRS	173	0068				
62	1	SRS	082	0003				
63	1	SRS	083	0003				
64	1	SRS	088	0003				
65	1	PTM	051	0000	<1			Plains Topminnow
66	1	SAS	067					Sand Shiner.
67	1	SAS	038	0053				Combined Wt
68	1	SAS	062					
69	1	SAS	058					
70	1	SAS	059					
71	1	SAS	060					
72	1	SAS	049					
73	1	SAS	047					
74	1	SAS	058					
75	1	SAS	059					
76	1	SAS	044					
77	1	SAS	047					
78	1	SAS	040					
79	1	SAS	055					
80	1	SAS	062					
81	1	SAS	051					
82	1	SAS	063					
83	1	SAS	044					
84	1	SAS	031					
85	1	SAS	045					
86	1	SAS	039					
87	1	SAS	057					
88	1	SAS	057					
89	1	SAS	057					
90	1	SAS	035					
91	1	SAS	034					
92	1	SAS	043					
93	1	SAS	046					
94	1	SAS	057					
95	1	SAS	049					
96	1	SAS	033					
97	1	SAS	050					
98	1	SAS	029					
99	1	SAS	043					
00	1	SAS	045					

SOUTH DAKOTA GAME FISH AND PARKS 3305 WEST SOUTH STREET RAPID CITY, SD 57702

Revised: 2JUL08

Stream Name Cheyenne River

Site Number CHR05

DATE dd-mmm-yy						
1	5	A	P	R	0	8

example 0 2 M A Y 9 2

Fish ID #	Pass #	Species Code	Total Length (mm)	Weight (grams)	Sca.	Mor.	Sex	Comments	Fish ID #	Pass #	Species Code	Total Length (mm)	Weight (grams)	Sca.	Mor.	Sex	Comments
1	1	SAS	033					Sand Shiner	51	1							
2	1	SAS	032						52	1							
3	1	SAS	032						53	1							
4	1								54	1							
5	1								55	1							
6	1								56	1							
7	1								57	1							
8	1								58	1							
9	1								59	1							
10	1								60	1							
11	1								61	1							
12	1								62	1							
13	1								63	1							
14	1								64	1							
15	1								65	1							
16	1								66	1							
17	1								67	1							
18	1								68	1							
19	1								69	1							
20	1								70	1							
21	1								71	1							
22	1								72	1							
23	1								73	1							
24	1								74	1							
25	1								75	1							
26	1								76	1							
27	1								77	1							
28	1								78	1							
29	1								79	1							
30	1								80	1							
31	1								81	1							
32	1								82	1							
33	1								83	1							
34	1								84	1							
35	1								85	1							
36	1								86	1							
37	1								87	1							
38	1								88	1							
39	1								89	1							
40	1								90	1							
41	1								91	1							
42	1								92	1							
43	1								93	1							
44	1								94	1							
45	1								95	1							
46	1								96	1							
47	1								97	1							
48	1								98	1							
49	1								99	1							
50	1								00	1							

S. D. GAME FISH AND PARKS - STREAM SURVEY FIELD DATA SHEET

Stream Name: Beaver Creek

Site Number:

DATE (d d m m m y y): 1 0 J U L 0 8

Site Description: BVC01 - Beaver Creek downstream

Site Length (meters): 1 0 0 S 0 9 R 0 1 E T 0 7 S

		Dist. below top net (meters)	Stream Widths (meters)		Smith-Roots	
pH:	7.9					
Cond. (umhos/cm):	2141				Mode:	
Temp.(C) air:	25.5	0	0.	50.0	Volts:	
Water:	23.4	10	0.	60.0		
		20	0.	70.0		
		30	0.	80.0		
		40	0.	90.0		
				100.		

Personnel: A. Wones, K. Shook, M. Winland

#1		#2		#3		#4	
#5		#6		#7		#8	
Data		Scales		Lengths		Weights	

	Pass #1	Pass #2	Pass #3	Pass #4	Pass #5
Start time: (hhmm)					
End time: (hhmm)					
Smith-Root (seconds)					
Shocker #1					
Smith-Root (seconds)					
Shocker #2					
Smith-Root (seconds)					
Shocker #3					

Barge Shocker:

Range (H/L): Percent: Amps: . Pulse:

Pass	Start time (h h m m)	End time (h h m m)	Duration (seconds)	Anode #1	Anode #2	Anode #3
1						
2						
3						
4						
5						

Stream Name: Beaver Creek

Bulk Weights - (Record #5)

	(m m)			(m m)			Pass#	Species			Total Number			Total Weight		
Size Range:			to	1	7	1	1	C	A	P			1		7	3
Size Range:	4	8	to		6	3	1	P	T	M			6		1	2
Size Range:			to		7	3	1	P	L	M			1			3
Size Range:			to		5	9	1	L	N	D			1			2
Size Range:	4	4	to		5	6	1	S	A	S		1	0		1	0
Size Range:	5	0	to		7	1	1	P	L	K			5			9
Size Range:	4	1	to		6	7	1	F	H	M		3	3		5	2
Size Range:			to													
Size Range:			to													
Size Range:			to													

Digital Photos - Description

Top Blocking Net Looking Upstream 107

Top Blocking Net Looking Downstream 108

Bottom Blocking Net Looking Upstream 103

Bottom Blocking Net Looking Downstream 104

Upstream blocknet UTM: N 579656; E 4811179

Downstream blocknet UTM: E 579641; N 4811209

Video Camera

Tape #:

Begin:

End:

	(d d m m m y y)	Personnel
Photos labeled:		
Photos filed:		

Comments: FHM = fathead minnow, LND = Long-Nosed Dace, SAS = Sand Shiner.
PLK = Plains Killifish, CAP = Carp, PTM = Plains Topminnow.
Mid reach looking upstream = 107, looking downstream 108.

DATA ENTRY - RECORD 2

	(d d m m m y y)	Personnel
Data Entry		
Verification:		

Field Q.C. by: A. Wones

Batch Number:

DATA ENTRY - RECORD 3

	(d d m m m y y)	Personnel
Data Entry		
Verification:		

DATA ENTRY - RECORD 4

	(d d m m m y y)	Personnel
Data Entry		
Verification:		

DATA ENTRY - RECORD 5

	(d d m m m y y)	Personnel
Data Entry		
Verification:		

SOUTH DAKOTA GAME FISH AND PARKS 3305 WEST SOUTH STREET RAPID CITY, SD 57702

Stream Name Beaver Creek
Site Number BVC01

DATE dd-mmm-yy
1 0 J U L 0 8

example 0 2 M A Y 9 2

Fish ID #	Pass #	Species Code	Total Length (mm)	Weight (grams)	Sca.	Mor.	Sex	Comments	Fish ID #	Pass #	Species Code	Total Length (mm)	Weight (grams)	Sca.	Mor.	Sex	Comments
1	1	CAP	171	73				R	51	1	FHM	57					
2	1	PTM	61	12				R,C(#2-7)	52	1	FHM	48					
3	1	PTM	52					R	53	1	FHM	47					
4	1	PTM	48					R	54	1	FHM	44					
5	1	PTM	63					R	55	1	FHM	47					
6	1	PTM	62					V	56	1	FHM	42					
7	1	PTM	50					R	57	1	SAS	44	<1				
8	1	PLM	73	3				V	58	1							
9	1	LND	59	2				V	59	1							
10	1	SAS	62	7				R,(C#10-14)	60	1							
11	1	SAS	53					R	61	1							
12	1	SAS	53					R	62	1							
13	1	SAS	46					R	63	1							
14	1	SAS	56					R	64	1							
15	1	SAS	49	3				V,C(#15-18)	65	1							
16	1	SAS	58					V	66	1							
17	1	SAS	40					V	67	1							
18	1	SAS	43					V	68	1							
19	1	PLK	71	9				R,(C#19-23)	69	1							
20	1	PLK	60					R	70	1							
21	1	PLK	62					R	71	1							
22	1	PLK	57					R	72	1							
23	1	PLK	50					R	73	1							
24	1	FHM	48	52				C(#24-56)	74	1							
25	1	FHM	50						75	1							
26	1	FHM	48						76	1							
27	1	FHM	42						77	1							
28	1	FHM	43						78	1							
29	1	FHM	42						79	1							
30	1	FHM	59						80	1							
31	1	FHM	50						81	1							
32	1	FHM	48						82	1							
33	1	FHM	46						83	1							
34	1	FHM	58						84	1							
35	1	FHM	49						85	1							
36	1	FHM	54						86	1							
37	1	FHM	49						87	1							
38	1	FHM	60						88	1							
39	1	FHM	67						89	1							
40	1	FHM	57						90	1							
41	1	FHM	45						91	1							
42	1	FHM	53						92	1							
43	1	FHM	46						93	1							
44	1	FHM	44						94	1							
45	1	FHM	41						95	1							
46	1	FHM	58						96	1							
47	1	FHM	46						97	1							
48	1	FHM	56						98	1							
49	1	FHM	55						99	1							
50	1	FHM	50						00	1							

Comments: R = sample collected for radiological testing, V = voucher specimen, C = combined weight 5 voucher and 5 radiological samples taken from # 24-56

S. D. GAME FISH AND PARKS - STREAM SURVEY FIELD DATA SHEET

Stream Name: Beaver Creek

Site Number:

DATE (d d m m m y y): 10 JUL 08

Site Description: BVC04 - Beaver Creek upstream

Site Length (meters): 100 S R T

pH:

Cond. (umhos/cm):

Temp.(C) air: 35.0

Water: 28.0

Dist. below top net (meters)	Stream Widths (meters)
0	50.0
10.0	60.0
20.0	70.0
30.0	80.0
40.0	90.0
	100.0

Smith-Roots: Mode: Volts:

Personnel: A. Wones, K. Shook, M. Winland

#1	#2	#3	#4
#5	#6	#7	#8
Data	Scales	Lengths	Weights

	Pass #1	Pass #2	Pass #3	Pass #4	Pass #5
Start time: (hhmm)					
End time: (hhmm)					
Smith-Root (seconds)					
Shocker #1					
Smith-Root (seconds)					
Shocker #2					
Smith-Root (seconds)					
Shocker #3					

Barge Shocker:

Range (H/L): Percent: Amps: . Pulse:

Pass	Start time (h h m m)	End time (h h m m)	Duration (seconds)	Anode #1	Anode #2	Anode #3
1						
2						
3						
4						
5						

Stream Name: Beaver Creek

Bulk Weights - (Record #5)

	(m m)			(m m)			Pass#	Species			Total Number			Total Weight		
Size Range:			to	1	3	6	1	S	H	R			1	1	3	0
Size Range:			to	2	6	0	1	C	A	P			1	2	3	7
Size Range:	4	8	to		6	8	1	P	L	K			9		1	3
Size Range:	4	3	to		6	1	1	F	H	M		4	7		6	4
Size Range:	6	3	to		6	4	1	L	N	D			2			5
Size Range:	4	5	to		5	8	1	S	A	S		2	6		3	5
Size Range:			to													
Size Range:			to													
Size Range:			to													
Size Range:			to													

Digital Photos - Description

Top Blocking Net Looking Upstream 122

Top Blocking Net Looking Downstream 123

Bottom Blocking Net Looking Upstream 118

Bottom Blocking Net Looking Downstream 119

Upstream blocknet WGS84 UTM: E 5791444; N 4820573

Downstream blocknet WGS84 UTM: E 571373; N 4820623

Video Camera

Tape #:

Begin:

End:

	(d d m m m y y)	Personnel
Photos labeled:		
Photos filed:		

Comments: FHM = fathead minnow, LND = Long-Nosed Dace, SAS = Sand Shiner.
SHR = Shorthead Redhorse Sucker, CAP = Carp, PLK = Plains Killifish.
Photo of the middle of reach looking upstream: 120, looking downstream: 121

DATA ENTRY - RECORD 2

	(d d m m m y y)	Personnel
Data Entry		
Verification:		

Field Q.C. by: A. Wones

Batch Number:

DATA ENTRY - RECORD 3

	(d d m m m y y)	Personnel
Data Entry		
Verification:		

DATA ENTRY - RECORD 4

	(d d m m m y y)	Personnel
Data Entry		
Verification:		

DATA ENTRY - RECORD 5

	(d d m m m y y)	Personnel
Data Entry		
Verification:		

SOUTH DAKOTA GAME FISH AND PARKS 3305 WEST SOUTH STREET RAPID CITY, SD 57702

Stream Name Beaver Creek
Site Number BVC04

DATE dd-mmm-yy: 1 0 J U L 0 8

example 0 2 M A Y 9 2

Fish ID #	Pass #	Species Code	Total Length (mm)	Weight (grams)	Scar.	Mor.	Sex	Comments	Fish ID #	Pass #	Species Code	Total Length (mm)	Weight (grams)	Scar.	Mor.	Sex	Comments
1	1	SHR	136	130				R	51	1	FHM	45					
2	1	CAP	260	237				R	52	1	FHM	51					
3	1	PLK	56	13				C	53	1	FHM	57					
4	1	PLK	68						54	1	FHM	55					
5	1	PLK	58						55	1	FHM	47					
6	1	PLK	48						56	1	FHM	53					
7	1	PLK	48						57	1	FHM	42					
8	1	PLK	62						58	1	FHM	49					
9	1	PLK	54						59	1	LND	63	3				V
10	1	PLK	52						60	1	LND	64	2				V
11	1	PLK	50						61	1	SAS	45	35				C
12	1	FHM	50	64				c	62	1	SAS	50					
13	1	FHM	49						63	1	SAS	47					
14	1	FHM	47						64	1	SAS	48					
15	1	FHM	55						65	1	SAS	51					
16	1	FHM	47						66	1	SAS	56					
17	1	FHM	55						67	1	SAS	55					
18	1	FHM	57						68	1	SAS	52					
19	1	FHM	49						69	1	SAS	55					
20	1	FHM	43						70	1	SAS	58					
21	1	FHM	60						71	1	SAS	57					
22	1	FHM	50						72	1	SAS	52					
23	1	FHM	55						73	1	SAS	51					
24	1	FHM	46						74	1	SAS	54					
25	1	FHM	51						75	1	SAS	48					
26	1	FHM	50						76	1	SAS	51					
27	1	FHM	51						77	1	SAS	53					
28	1	FHM	51						78	1	SAS	48					
29	1	FHM	50						79	1	SAS	52					
30	1	FHM	47						80	1	SAS	54					
31	1	FHM	44						81	1	SAS	54					
32	1	FHM	54						82	1	SAS	57					
33	1	FHM	50						83	1	SAS	51					
34	1	FHM	46						84	1	SAS	52					
35	1	FHM	45						85	1	SAS	52					
36	1	FHM	49						86	1	SAS	52					
37	1	FHM	55						87	1							
38	1	FHM	49						88	1							
39	1	FHM	47						89	1							
40	1	FHM	49						90	1							
41	1	FHM	52						91	1							
42	1	FHM	49						92	1							
43	1	FHM	55						93	1							
44	1	FHM	53						94	1							
45	1	FHM	49						95	1							
46	1	FHM	50						96	1							
47	1	FHM	61						97	1							
48	1	FHM	45						98	1							
49	1	FHM	46						99	1							
50	1	FHM	49						00	1							

Comments: R = sample collected for radiological testing, V = voucher specimen, C = combined weight
5 voucher and 5 radiological samples taken from # 12-58 (FHM), and from #61-86(SAS)

S. D. GAME FISH AND PARKS - STREAM SURVEY FIELD DATA SHEET
REVISED 2JUL2008

Stream Name: Cheyenne River

Site Number:

DATE (d d m m m y y): 15 APR 08

Site Description: Site CHR05 - Cheyenne River at Marietta

Site Length (meters): 100 S 06 R 02E T 39N

pH:
Cond. (umhos/cm):
Temp. (C) air:
Water: 15.0

Dist. below top net (meters) / Stream Widths (meters)

0				5	0				
10				6	0				
20				7	0				
30				8	0				
40				9	0				
				100					

Smith-Roots
Mode:
Volts:

Personnel:

#1 #2 #3 #4
#5 #6 #7 #8
Data Scales Lengths Weights

	Pass #1	Pass #2	Pass #3	Pass #4	Pass #5
Start time: (hhmm)					
End time: (hhmm)					
Smith-Root (seconds)					
Shocker #1					
Smith-Root (seconds)					
Shocker #2					
Smith-Root (seconds)					
Shocker #3					

Barge Shocker:
Range (H/L): Percent: Amps: . Pulse:

Pass	Start time (h h m m)	End time (h h m m)	Duration (seconds)	Anode #1	Anode #2	Anode #3
1						
2						
3						
4						
5						

REVISED 2JUL2008

Stream Name: Cheyenne River

Bulk Weights - (Record #5)

	(m m)				(m m)		Pass#	Species		Total Number			Total Weight		
Size Range:	9	7	to	0	9	7		R	I	C	0	0	1	0	1	3
Size Range:	9	8	to	0	9	8		G	R	S	0	0	1	0	2	0
Size Range:	3	2	to	0	7	4		P	L	K	0	4	8	0	6	9
Size Range:	8	2	to	2	2	0		S	R	S	0	1	4	6	1	2
Size Range:	5	1	to	0	5	1		P	T	M	0	0	1	0	0	<1
Size Range:	3	1	to	0	6	7		S	A	S	0	3	8	0	5	3
Size Range:	2	5	to	0	8	8		C	R	C	1	0	0	0	9	1
Size Range:			to													
Size Range:			to													
Size Range:			to													

Digital Photos - Description

Top Blocking Net Looking Upstream

Top Blocking Net Looking Downstream

Bottom Blocking Net Looking Upstream

Bottom Blocking Net Looking Downstream

Upstream blocknet at UTM E0587455 N4804678

Downstream blocknet at UTM E0587538 N4804736

Video Camera

Tape #:

Begin:

End:

	(d d m m m y y)	Personnel
Photos labeled:		
Photos filed:		

Comments: RIC= River Carpsucker; GRS = Green Sunfish; PLK = Plains kilifish; SRS = Shorthead Redhorse Sucker; PTM = Plains Topminnow; SAS = Sand Shiner; CRC = Creek Chub.

DATA ENTRY - RECORD 2

	(d d m m m y y)	Personnel
Data Entry		
Verification:		

Field Q.C. by: A. Wones

Batch Number:

DATA ENTRY - RECORD 3

	(d d m m m y y)	Personnel
Data Entry		
Verification:		

DATA ENTRY - RECORD 4

	(d d m m m y y)	Personnel
Data Entry		
Verification:		

DATA ENTRY - RECORD 5

	(d d m m m y y)	Personnel
Data Entry		
Verification:		

SOUTH DAKOTA GAME FISH AND PARKS 3305 WEST SOUTH STREET RAPID CITY, SD 57702

Stream Name Cheyenne River
Site Number CHR05

DATE dd-mmm-yy: 09JUL08

example 02MAY92

Fish ID #	Pass #	Species Code	Total Length (mm)	Weight (grams)	Sca.	Mor.	Sex	Comments	Fish ID #	Pass #	Species Code	Total Length (mm)	Weight (grams)	Sca.	Mor.	Sex	Comments
1	1	RIC	415	1150				R	51	1	SAS	51					
2	1	RIC	426	1200				R	52	1	SAS	45					
3	1	RIC	405	980				R	53	1	SAS	50					
4	1	RIC	381	820				R	54	1	SAS	44					
5	1	SRS	160	46				R	55	1	SAS	60					
6	1	SRS	146	32				R	56	1	SAS	47					
7	1	CAP	135	31				R	57	1	SAS	54					
8	1	CHC	290	166				R	58	1	SAS	46					
9	1	CHC	196	50				R	59	1	SAS	52					
10	1	CHC	181	49				R	60	1	SAS	46	6				V,C(60-64)
11	1	LND	74	4				V	61	1	SAS	45					V
12	1	PLK	72	10				R,C (#12-16)	62	1	SAS	50					V
13	1	PLK	59					R	63	1	SAS	46					V
14	1	PLK	51					R	64	1	SAS	50					V
15	1	PLK	68					R	65	1	FHM	46	7				R,C(65-74)
16	1	PLK	46					R	66	1	FHM	38					R
17	1	PLK	54	3			3	V,C(#17-18)	67	1	FHM	60					R
18	1	PLK	53					V	68	1	FHM	44					R
19	1	SAS	49	7				R,C(#19-23)	69	1	FHM	51					R
20	1	SAS	50					R	70	1	FHM	48					V
21	1	SAS	53					R	71	1	FHM	46					V
22	1	SAS	46					R	72	1	FHM	46					V
23	1	SAS	48					R	73	1	FHM	47					V
24	1	SAS	50	54				C	74	1	FHM	47					V
25	1	SAS	46						75	1							
26	1	SAS	49						76	1							
27	1	SAS	43						77	1							
28	1	SAS	47						78	1							
29	1	SAS	46						79	1							
30	1	SAS	50						80	1							
31	1	SAS	47						81	1							
32	1	SAS	45						82	1							
33	1	SAS	53						83	1							
34	1	SAS	46						84	1							
35	1	SAS	52						85	1							
36	1	SAS	52						86	1							
37	1	SAS	42						87	1							
38	1	SAS	47						88	1							
39	1	SAS	51						89	1							
40	1	SAS	49						90	1							
41	1	SAS	46						91	1							
42	1	SAS	54						92	1							
43	1	SAS	52						93	1							
44	1	SAS	46						94	1							
45	1	SAS	48						95	1							
46	1	SAS	53						96	1							
47	1	SAS	52						97	1							
48	1	SAS	54						98	1							
49	1	SAS	47						99	1							
50	1	SAS	46						00	1							

Comments: R = sample collected for radiological testing, V = voucher specimen, C = combined weight

APPENDIX 3.6-A

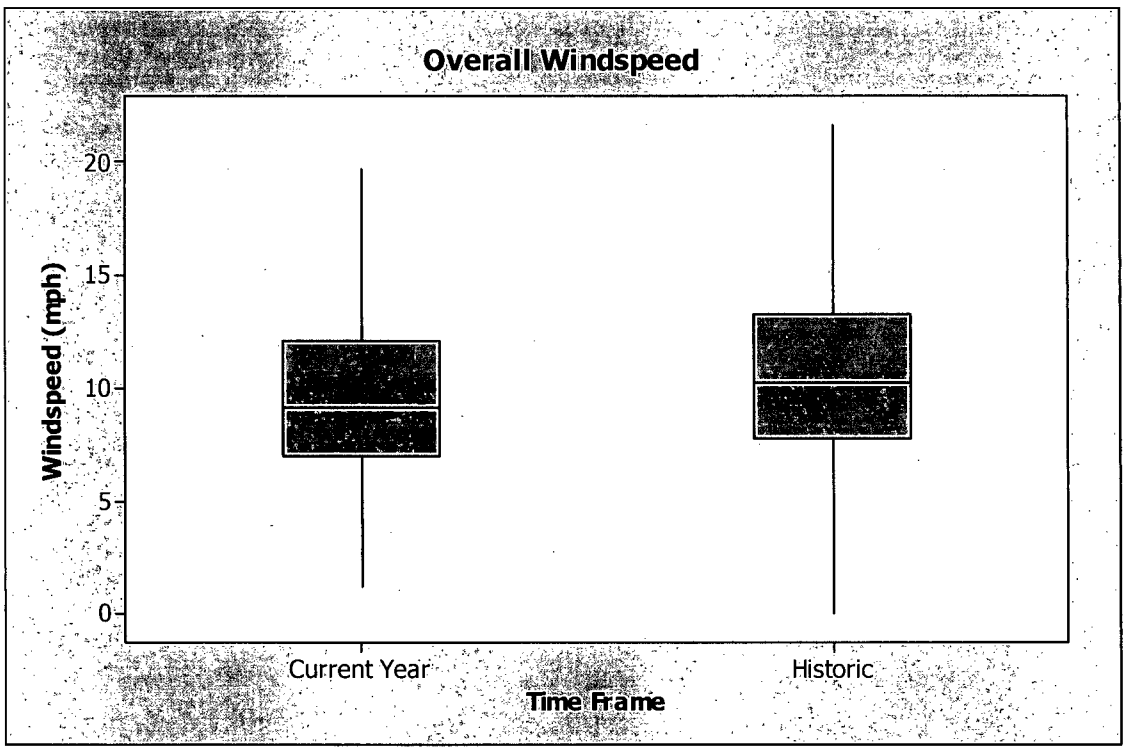
STATISTICAL REPORTS FOR CHADRON, NEBRASKA, METEOROLOGICAL SITE

APPENDIX 2.5-A
STATISTICAL REPORTS FOR CHADRON, NEBRASKA, METEOROLOGICAL SITE

WIND SPEED ANALYSIS

Descriptive Statistics: Average

Variable	Time Frame	N	N*	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	363	0	9.766	3.901	1.202	7.003	9.097	12.062	24.197
	Historic	9323	0	10.834	4.380	0.0000	7.705	10.251	13.276	36.090



Descriptive Statistics: Average

Results for Month = 1

Variable	Time Frame	Total Count	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	31	10.039	4.094	2.628	7.401	9.351	11.741	22.461
	Historic	805	9.969	4.400	0.000	6.872	9.351	12.545	33.099

Results for Month = 2

Variable	Time Frame	Total Count	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	28	9.265	3.874	1.202	6.539	9.456	12.080	16.662
	Historic	734	10.475	4.672	1.727	7.250	9.768	13.160	33.239

Results for Month = 3

Variable	Time Frame	Total Count	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	31	10.404	3.879	5.155	7.690	9.111	12.706	24.197
	Historic	806	11.572	4.854	2.488	7.990	10.971	14.349	32.986

Results for Month = 4

Variable	Time Frame	Total Count	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	30	11.210	4.791	3.812	6.482	11.637	15.219	20.545
	Historic	779	12.533	4.954	2.187	8.901	11.800	15.525	36.090

Results for Month = 5

Variable	Time Frame	Total Count	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	30	11.037	4.779	3.040	7.314	10.209	13.414	21.464
	Historic	803	11.847	4.651	2.614	8.515	11.193	14.401	29.690

Results for Month = 6

Variable	Time Frame	Total Count	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	30	9.173	2.852	5.124	6.830	8.768	11.103	16.576
	Historic	779	11.213	3.746	2.507	8.571	10.725	13.566	24.299

Results for Month = 7

Variable	Time Frame	Total Count	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	31	9.991	3.371	4.327	7.597	9.627	12.062	19.401
	Historic	792	10.542	3.369	0.000	8.053	10.094	12.467	24.818

Results for Month = 8

Variable	Time Frame	Total Count	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	30	9.421	3.151	2.865	7.624	9.205	10.766	18.912
	Historic	775	10.472	3.429	2.064	7.844	10.132	12.514	24.324

Results for Month = 9

Variable	Time Frame	Total Count	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	30	10.667	4.215	5.220	7.115	10.023	13.396	19.880
	Historic	750	10.526	4.003	1.749	7.420	9.984	13.051	25.404

Results for Month = 10

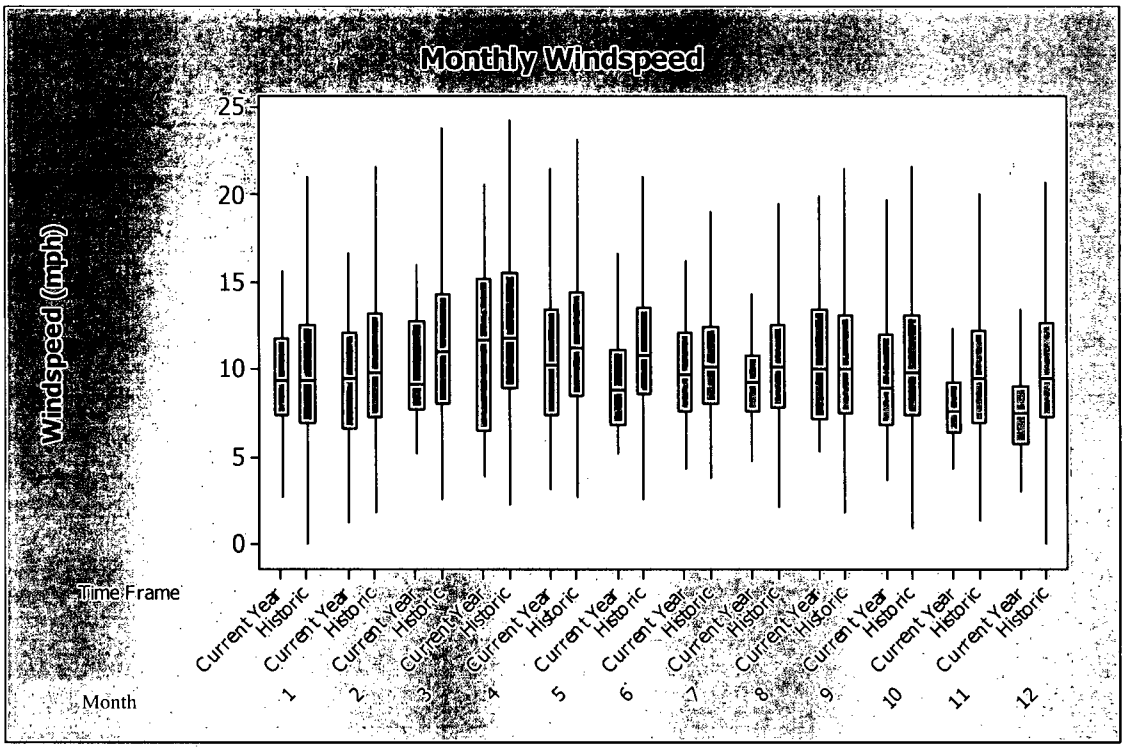
Variable	Time Frame	Total Count	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	31	9.678	3.770	3.607	6.814	8.911	12.034	19.648
	Historic	775	10.565	4.585	0.895	7.322	9.743	13.080	29.291

Results for Month = 11

Variable	Time Frame	Total Count	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	30	8.398	3.250	4.316	6.382	7.567	9.261	18.245
	Historic	750	10.062	4.299	1.263	6.878	9.442	12.215	30.728

Results for Month = 12

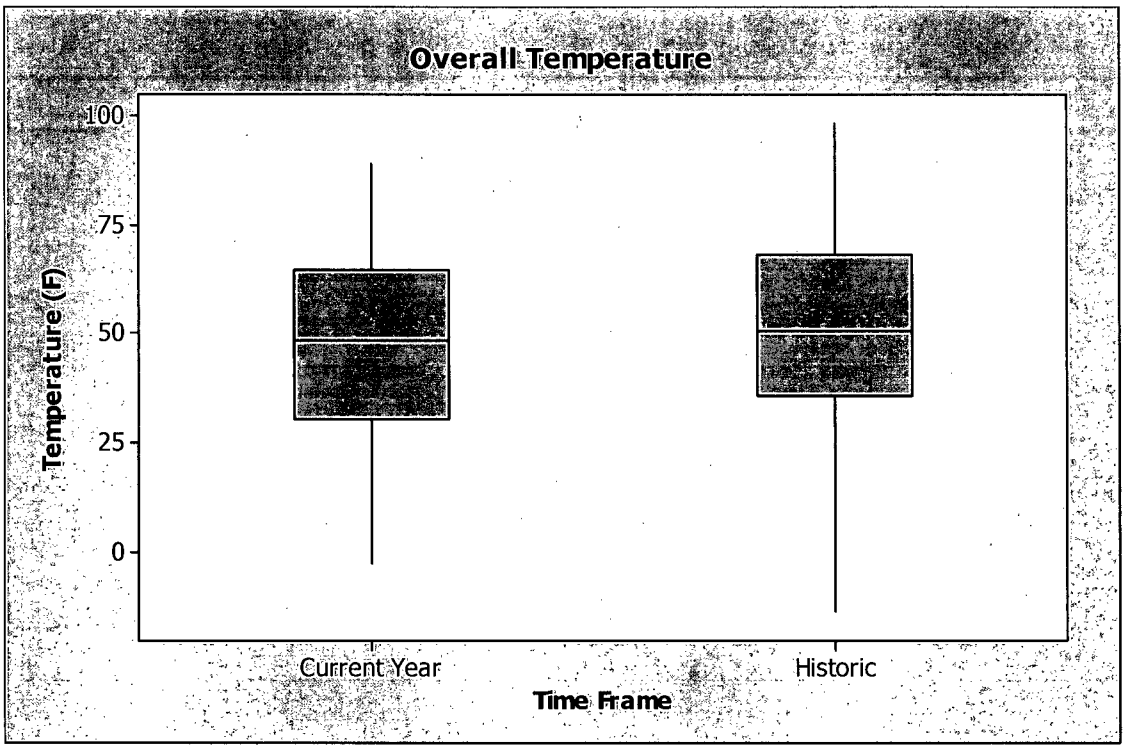
Variable	Time Frame	Total Count	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	31	7.899	3.515	2.945	5.676	7.419	8.985	18.620
	Historic	775	10.139	4.447	0.000	7.200	9.405	12.690	28.052



TEMPERATURE ANALYSIS

Descriptive Statistics: Average

Variable	Time Frame	N	N*	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	360	0	47.81	21.42	-3.06	30.29	48.15	64.48	89.00
	Historic	9323	0	50.520	21.204	-22.804	35.285	50.470	68.277	98.060



Descriptive Statistics: Average

Results for Month = 1

Variable	Time Frame	Total Count	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	31	20.10	11.15	-3.06	11.02	20.90	30.05	41.75
	Historic	805	25.444	13.243	-13.206	16.486	28.325	35.735	52.363

Results for Month = 2

Variable	Time Frame	Total Count	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	25	26.63	8.83	6.80	22.10	25.57	30.77	44.60
	Historic	734	29.789	14.064	-19.400	21.961	32.404	40.138	56.264

Results for Month = 3

Variable	Time Frame	Total Count	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	31	35.66	6.83	19.68	31.56	35.21	39.92	49.40
	Historic	806	39.270	11.838	-5.766	32.195	39.824	47.376	67.179

Results for Month = 4

Variable	Time Frame	Total Count	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	30	44.52	10.23	25.51	37.89	42.09	50.58	66.80
	Historic	779	48.966	10.533	17.825	41.879	48.650	56.150	78.016

Results for Month = 5

Variable	Time Frame	Total Count	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	30	53.27	8.48	32.77	48.52	54.41	59.74	65.38
	Historic	803	59.470	9.313	32.300	52.925	59.942	66.412	82.085

Results for Month = 6

Variable	Time Frame	Total Count	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	30	64.19	5.76	53.76	59.61	63.96	68.17	74.60
	Historic	779	70.139	8.401	42.271	64.510	70.600	76.087	90.100

Results for Month = 7

Variable	Time Frame	Total Count	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	31	77.43	6.60	66.13	73.28	77.70	82.25	89.00
	Historic	792	77.463	7.490	55.772	72.369	77.528	82.714	98.060

Results for Month = 8

Variable	Time Frame	Total Count	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	30	76.66	7.91	56.86	74.04	78.56	81.44	88.91
	Historic	775	75.797	7.493	49.964	71.150	76.175	81.170	96.080

Results for Month = 9

Variable	Time Frame	Total Count	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	30	65.18	10.71	47.98	56.67	66.24	74.34	83.08
	Historic	750	65.205	10.569	30.920	57.805	65.806	72.905	92.104

Results for Month = 10

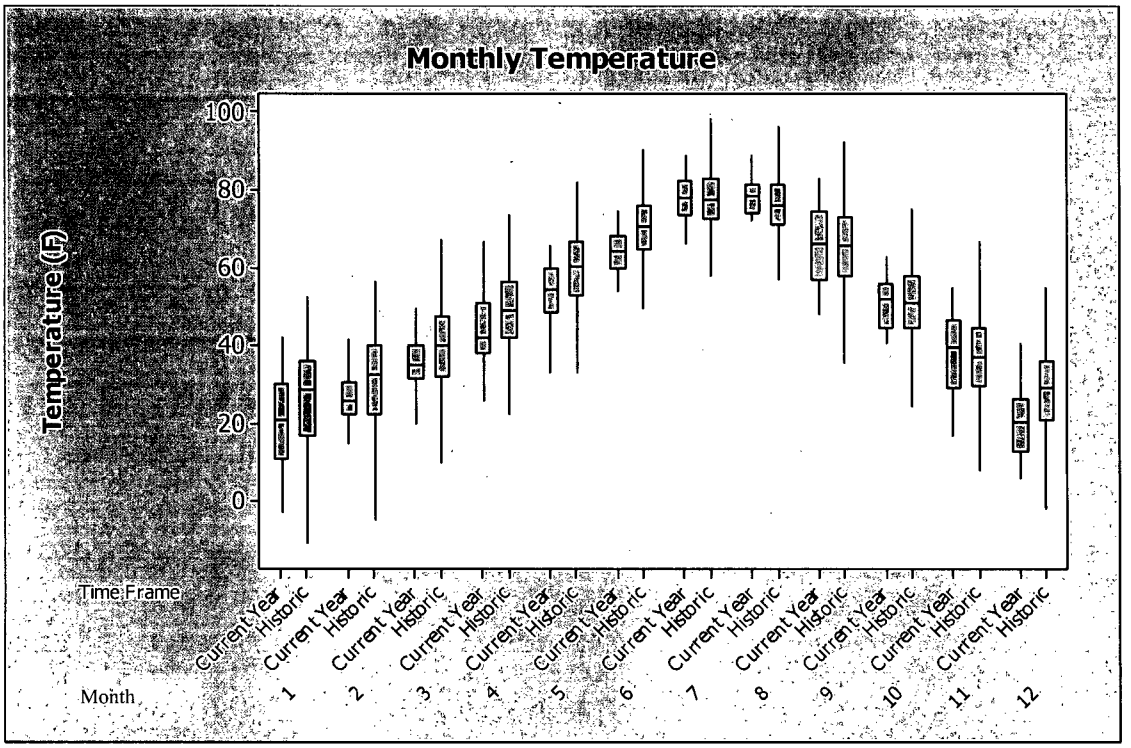
Variable	Time Frame	Total Count	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	31	50.72	6.48	40.40	44.46	51.80	55.79	62.83
	Historic	775	50.781	9.958	6.935	44.293	51.013	57.740	75.094

Results for Month = 11

Variable	Time Frame	Total Count	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	30	37.37	10.94	16.48	28.94	39.33	46.27	54.82
	Historic	750	36.365	11.494	-1.710	29.576	37.075	44.349	66.358

Results for Month = 12

Variable	Time Frame	Total Count	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Average	Current Year	31	19.62	8.59	5.98	12.78	20.24	26.15	40.45
	Historic	775	26.888	12.946	-22.804	20.427	28.811	35.960	54.950


Monthly Temperature
Temperature (F)
100
80
60
40
20
0
Time Frame
Current Year
Historic
Month
1
2
3
4
5
6
7
8
9
10
11
12

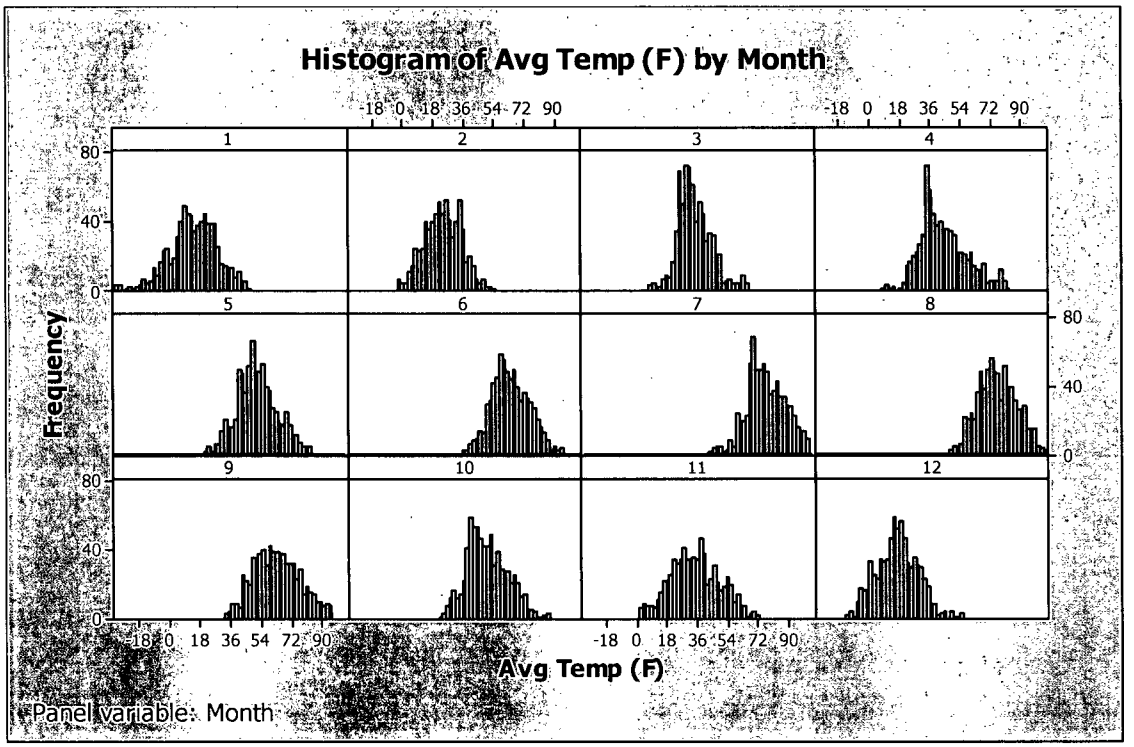
APPENDIX 3.6-B

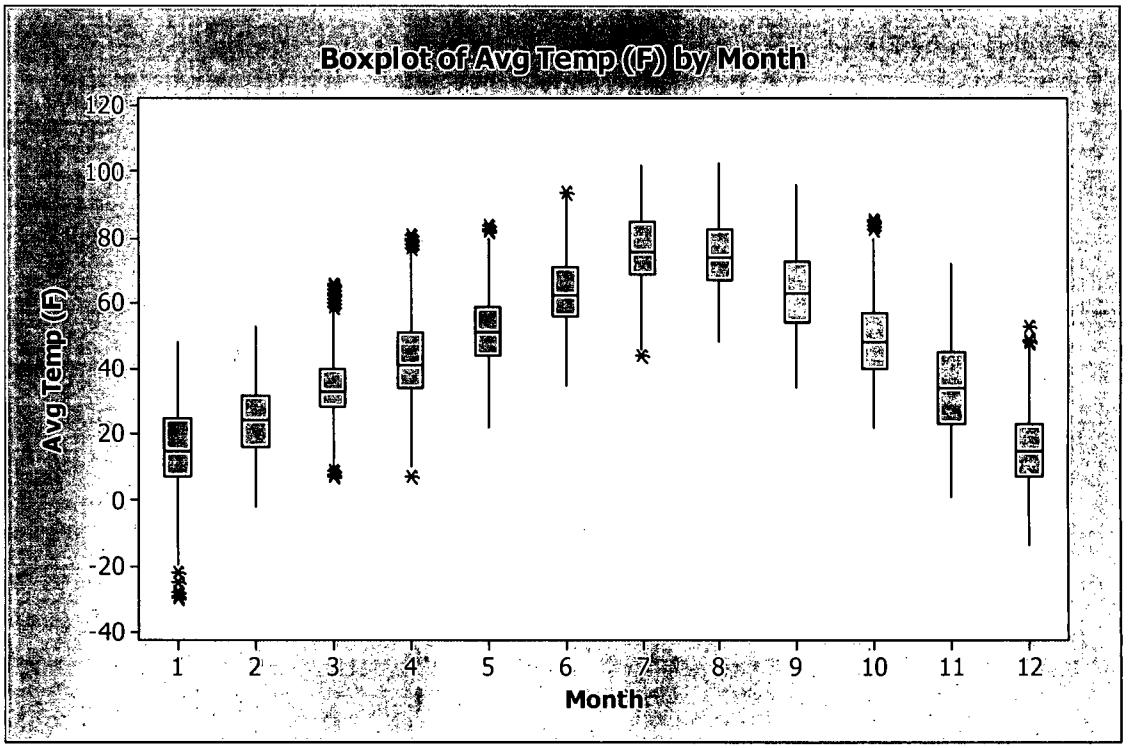
STATISTICAL REPORTS FOR DEWEY-BURDOCK METEOROLOGICAL SITE

APPENDIX 3.6-B
STATISTICAL REPORTS FOR DEWEY-BURDOCK METEOROLOGICAL SITE

Descriptive Statistics: Avg Temp (F)

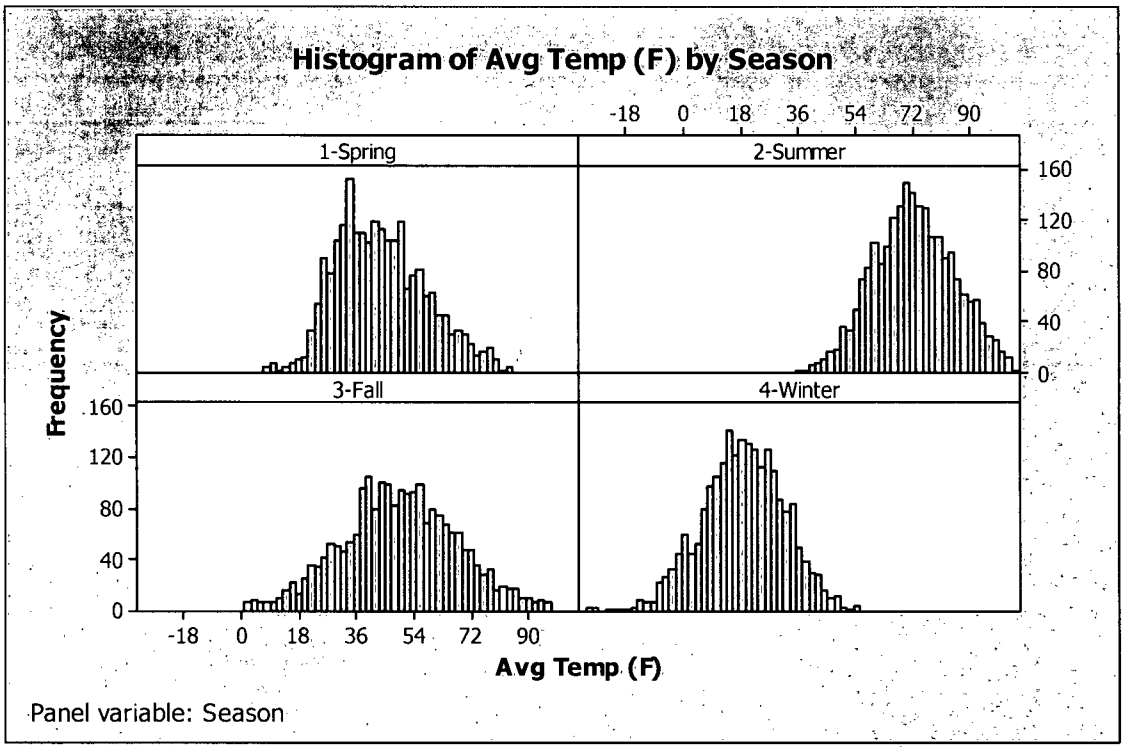
Variable	Month	N	N*	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Avg Temp (F)	1	744	0	14.792	13.859	-30.000	7.000	15.000	25.000	48.000
	2	696	0	23.520	10.861	-2.000	16.000	24.000	32.000	53.000
	3	720	0	34.550	10.040	7.000	28.000	33.000	40.000	66.000
	4	720	0	43.082	13.914	7.000	34.000	41.000	51.000	81.000
	5	744	0	52.173	11.654	22.000	44.000	51.000	59.000	84.000
	6	720	0	63.306	10.914	35.000	56.000	62.000	71.000	94.000
	7	744	0	76.858	11.231	44.000	69.000	76.000	85.000	102.000
	8	744	0	75.160	11.226	48.000	67.000	74.000	83.000	103.000
	9	720	0	63.747	13.787	34.000	54.000	63.000	73.000	96.000
	10	744	0	49.210	12.055	22.000	40.000	48.000	57.000	86.000
	11	720	0	34.061	14.761	1.000	23.000	34.000	45.000	72.000
	12	744	0	15.073	12.085	-14.000	7.000	15.000	23.000	53.000

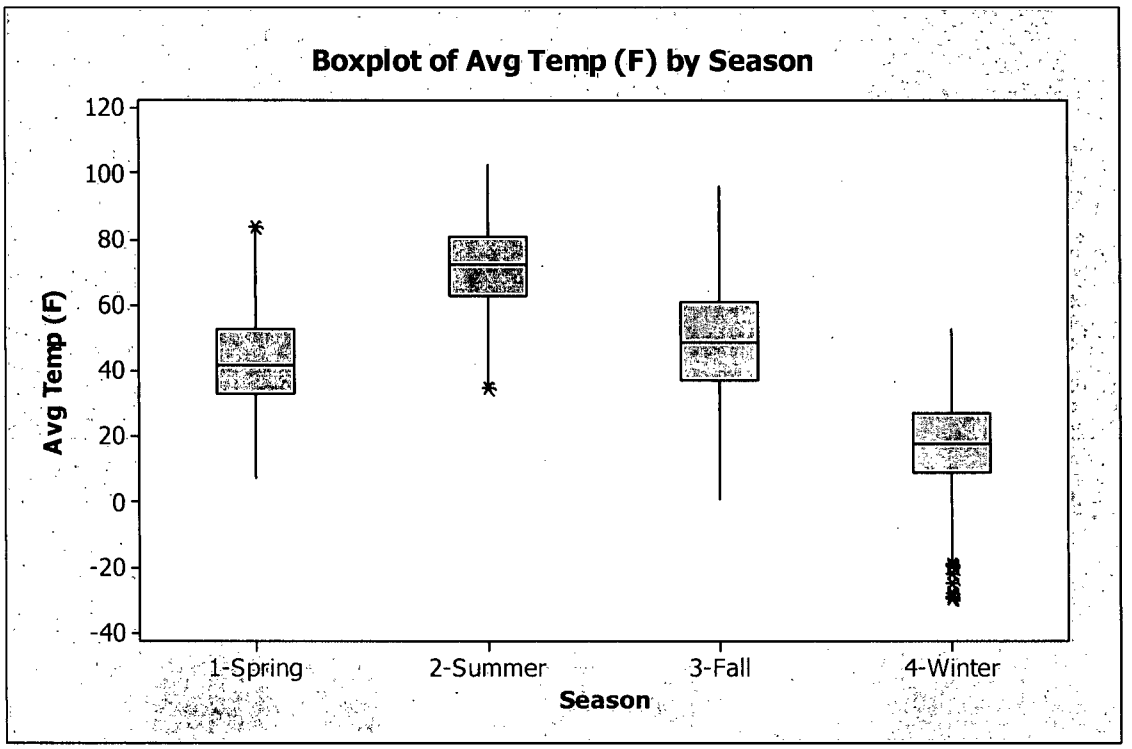




Descriptive Statistics: Avg Temp (F)

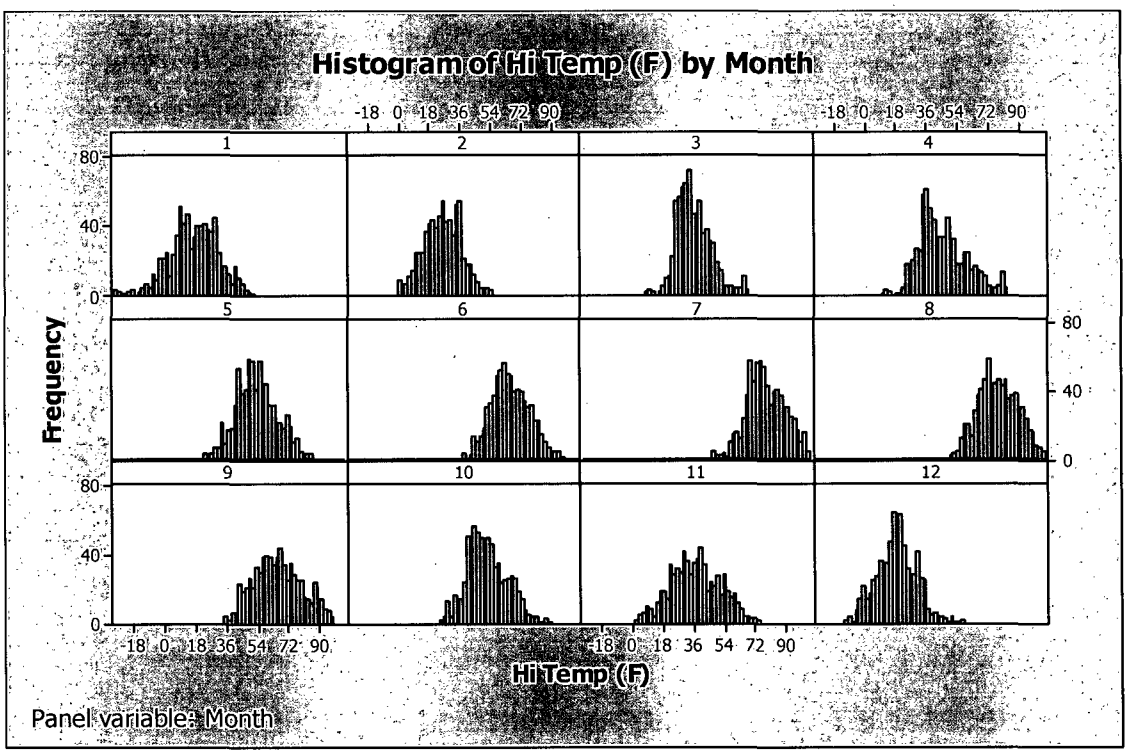
Variable	Season	N	N*	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Avg Temp (F)	1-Spring	2184	0	43.366	13.975	7.000	33.000	42.000	53.000	84.000
	2-Summer	2208	0	71.866	12.636	35.000	63.000	72.000	81.000	103.000
	3-Fall	2184	0	49.008	18.144	1.000	37.000	49.000	61.000	96.000
	4-Winter	2184	0	17.669	12.987	-30.000	9.000	18.000	27.000	53.000

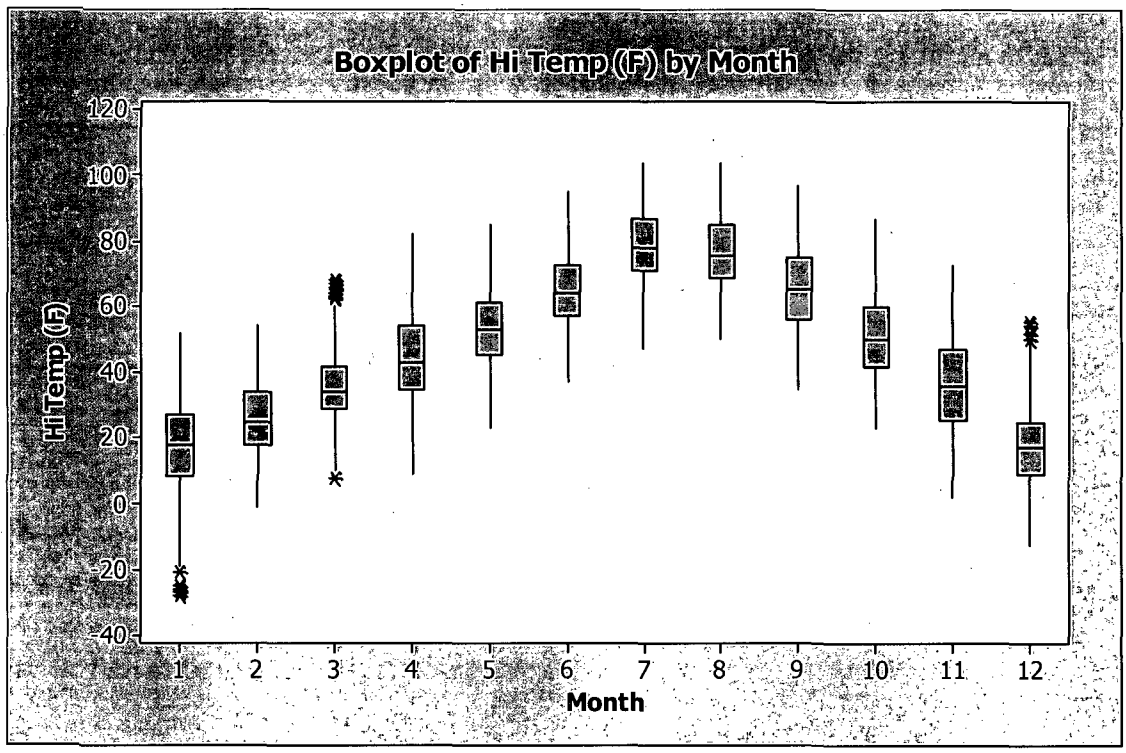

Histogram of Avg Temp (F) by Season
1-Spring
2-Summer
3-Fall
4-Winter
Frequency
Avg Temp (F)
-18 0 18 36 54 72 90
0 40 80 120 160
Panel variable: Season


Boxplot of Avg Temp (F) by Season
Avg Temp (F)
120
100
80
60
40
20
0
-20
-40
1-Spring
2-Summer
3-Fall
4-Winter
Season

Descriptive Statistics: Hi Temp (F)

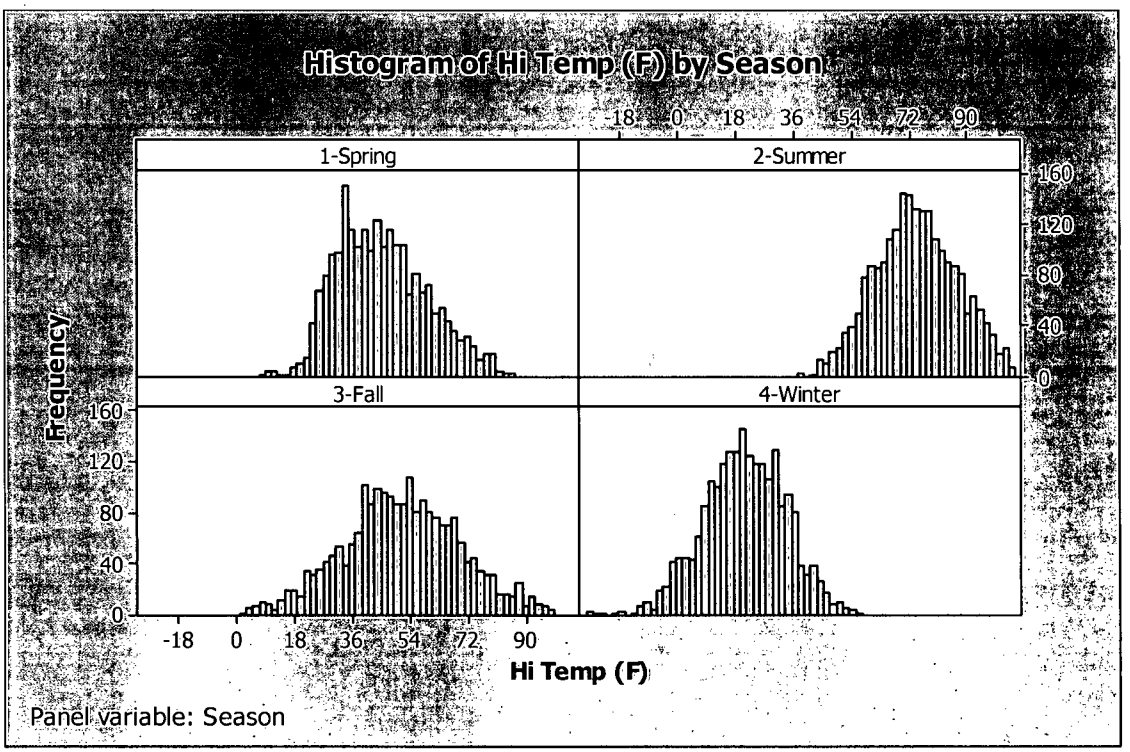
Variable	Month	N	N*	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Hi Temp (F)	1	744	0	17.176	14.043	-28.000	8.250	18.000	27.000	52.000
	2	696	0	25.307	10.827	-1.000	18.000	25.000	34.000	54.000
	3	720	0	36.100	10.286	8.000	29.000	34.000	42.000	68.000
	4	720	0	44.954	14.008	9.000	35.000	43.000	54.000	82.000
	5	744	0	53.663	11.834	23.000	45.000	53.000	61.000	85.000
	6	720	0	65.026	10.932	37.000	57.000	64.000	73.000	95.000
	7	744	0	78.593	11.209	47.000	71.000	78.000	87.000	104.000
	8	744	0	76.902	11.387	50.000	69.000	76.000	85.000	104.000
	9	720	0	65.635	13.798	35.000	56.000	65.000	75.000	97.000
	10	744	0	51.003	12.020	23.000	42.000	50.000	60.000	87.000
	11	720	0	36.133	14.917	2.000	25.250	36.000	47.000	73.000
	12	744	0	17.262	11.831	-13.000	9.000	17.000	25.000	55.000

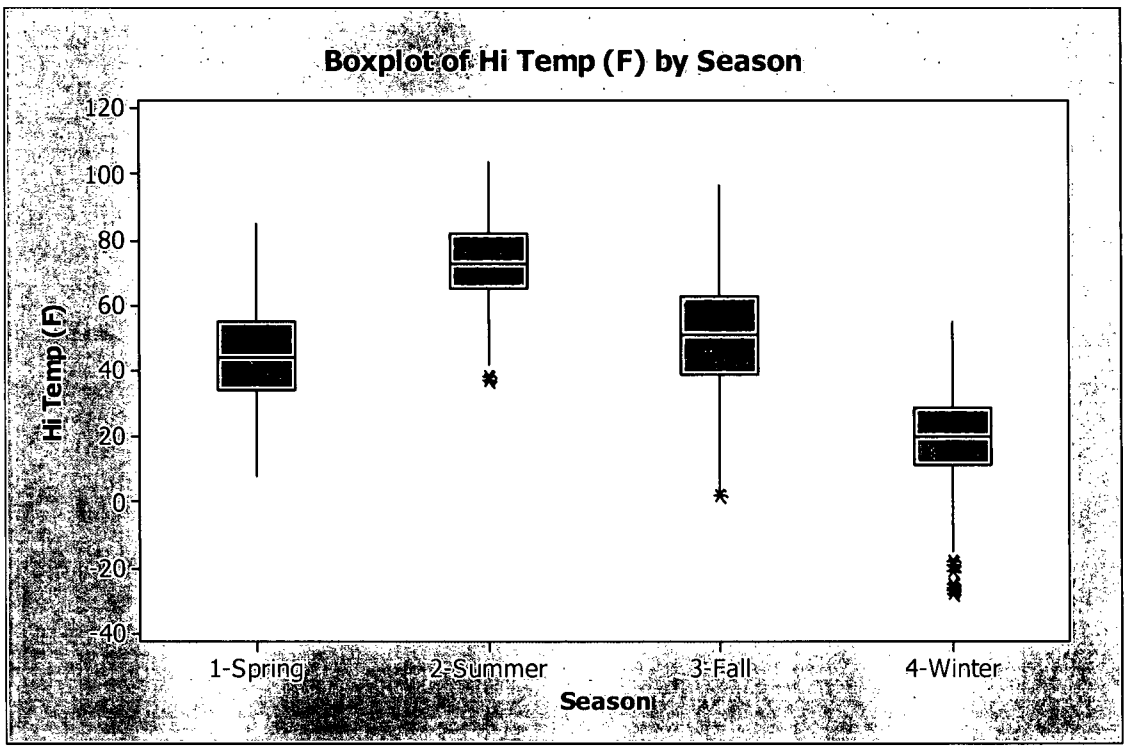




Descriptive Statistics: Hi Temp (F)

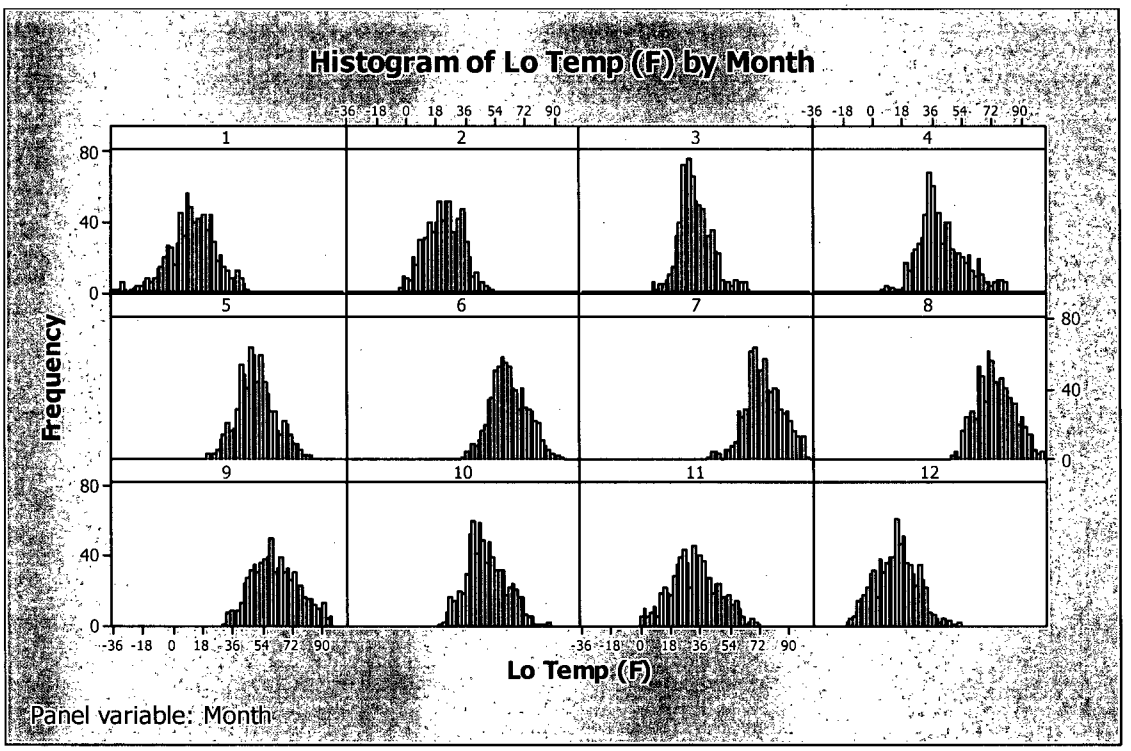
Variable	Season	N	N*	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Hi Temp (F)	1-Spring	2184	0	45.002	14.101	8.000	34.000	44.000	55.000	85.000
	2-Summer	2208	0	73.599	12.686	37.000	65.000	73.000	82.000	104.000
	3-Fall	2184	0	50.924	18.130	2.000	39.000	51.000	63.000	97.000
	4-Winter	2184	0	19.797	12.896	-28.000	11.000	20.000	29.000	55.000

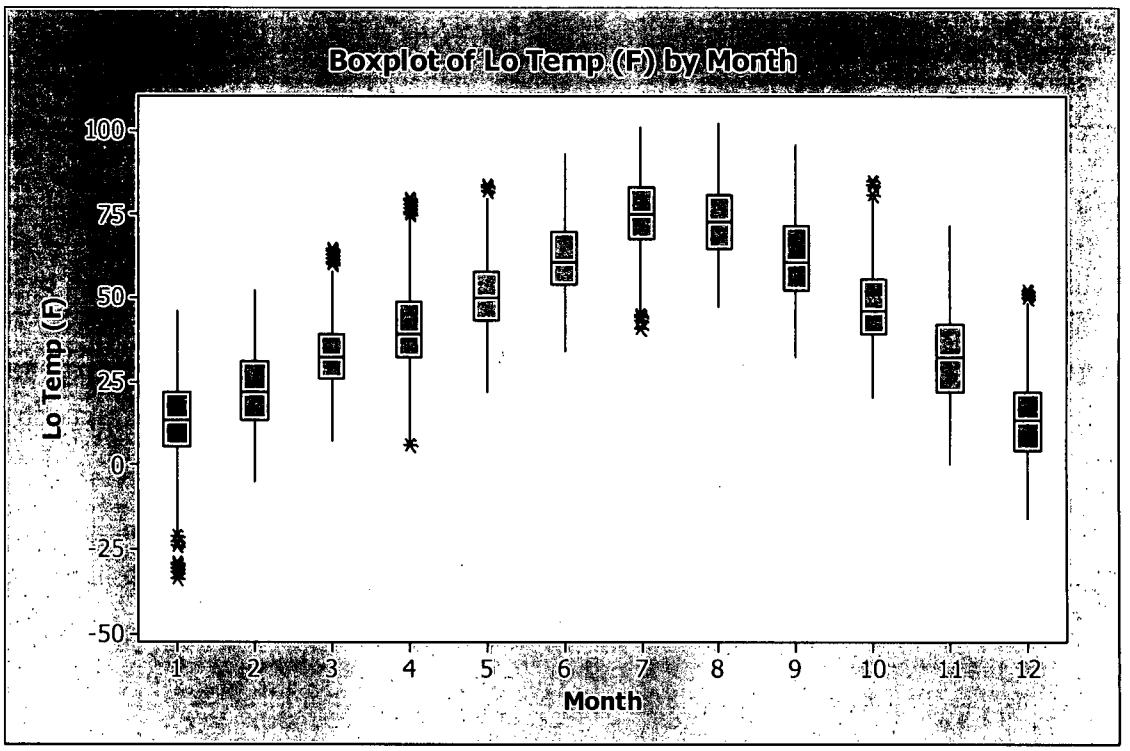

Histogram of Hi Temp (F) by Season
1-Spring
2-Summer
3-Fall
4-Winter
Frequency
Hi Temp (F)
Panel variable: Season


Boxplot of Hi Temp (F) by Season
Hi Temp (F)
1-Spring
2-Summer
3-Fall
4-Winter
Season

Descriptive Statistics: Lo Temp (F)

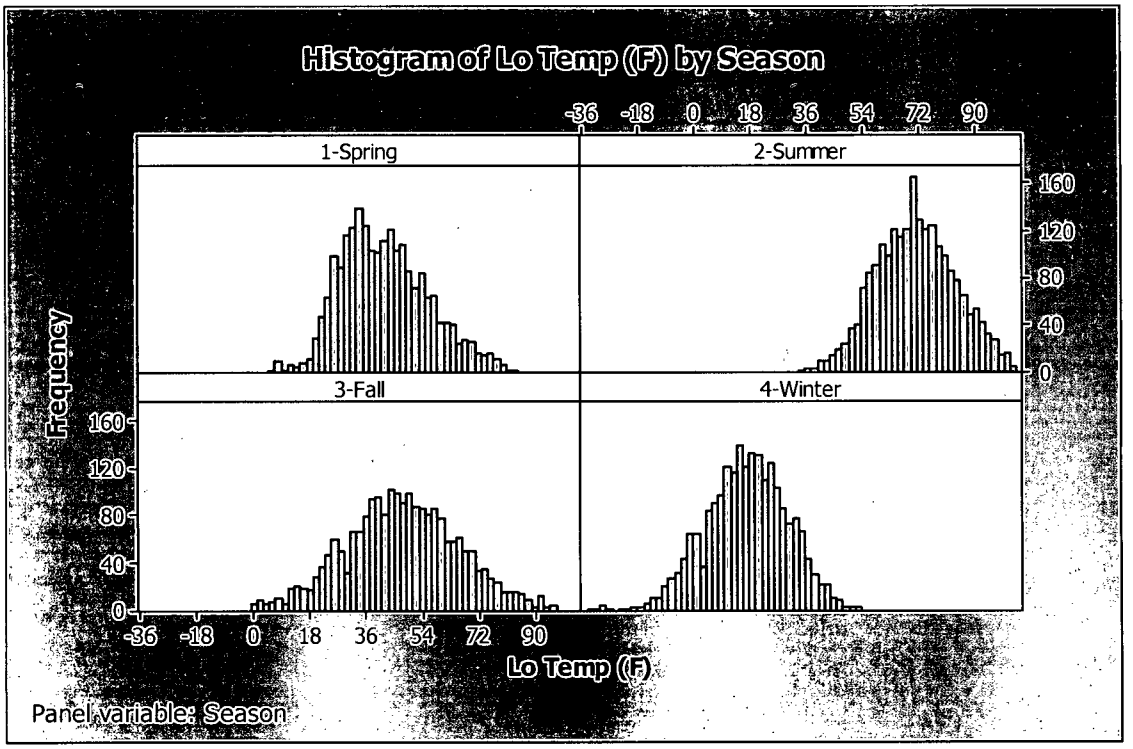
Variable	Month	N	N*	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Lo Temp (F)	1	744	0	12.538	13.869	-34.000	5.000	13.000	22.000	46.000
	2	696	0	21.797	11.032	-5.000	13.250	22.000	31.000	52.000
	3	720	0	32.993	9.890	7.000	26.000	32.000	39.000	65.000
	4	720	0	41.326	13.840	6.000	32.000	39.000	49.000	80.000
	5	744	0	50.719	11.503	22.000	43.000	50.000	58.000	84.000
	6	720	0	61.635	10.928	34.000	54.000	61.000	70.000	93.000
	7	744	0	75.144	11.330	41.000	68.000	75.000	83.000	101.000
	8	744	0	73.449	11.173	47.000	65.000	73.000	81.000	102.000
	9	720	0	61.931	13.775	32.000	52.000	61.000	72.000	96.000
	10	744	0	47.539	12.074	20.000	39.000	46.000	55.750	85.000
	11	720	0	32.004	14.599	0.000	22.000	32.000	42.000	72.000
	12	744	0	12.957	12.541	-16.000	4.000	13.000	22.000	52.000

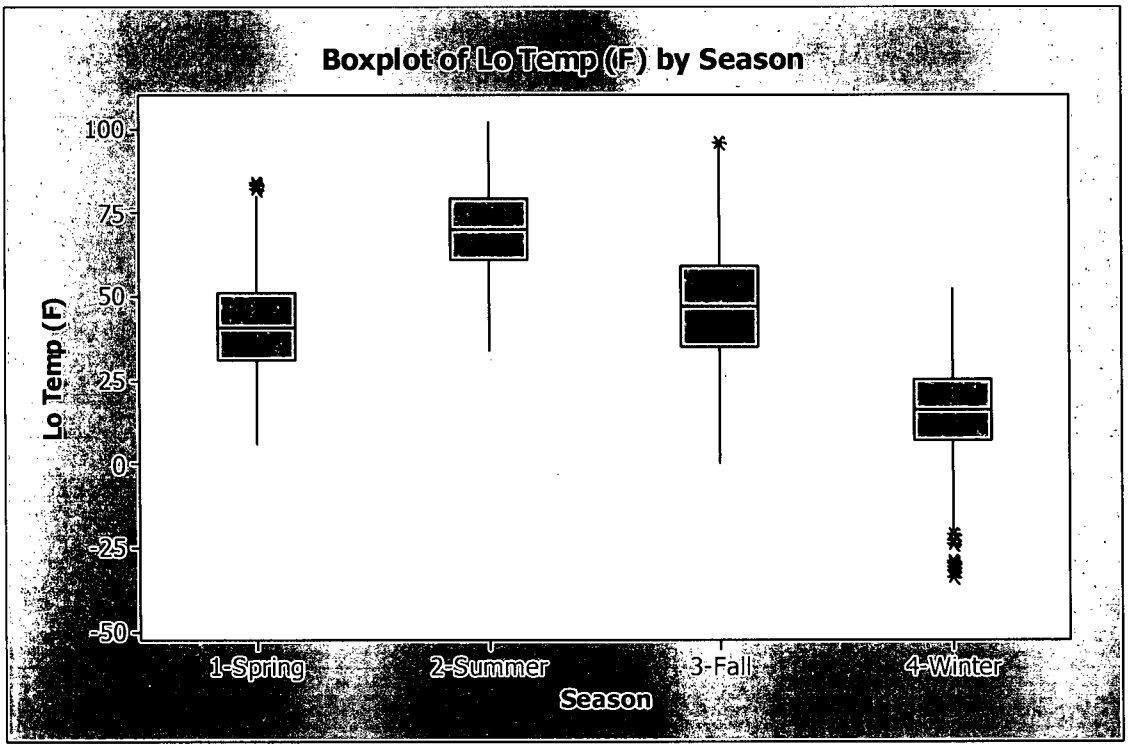




Descriptive Statistics: Lo Temp (F)

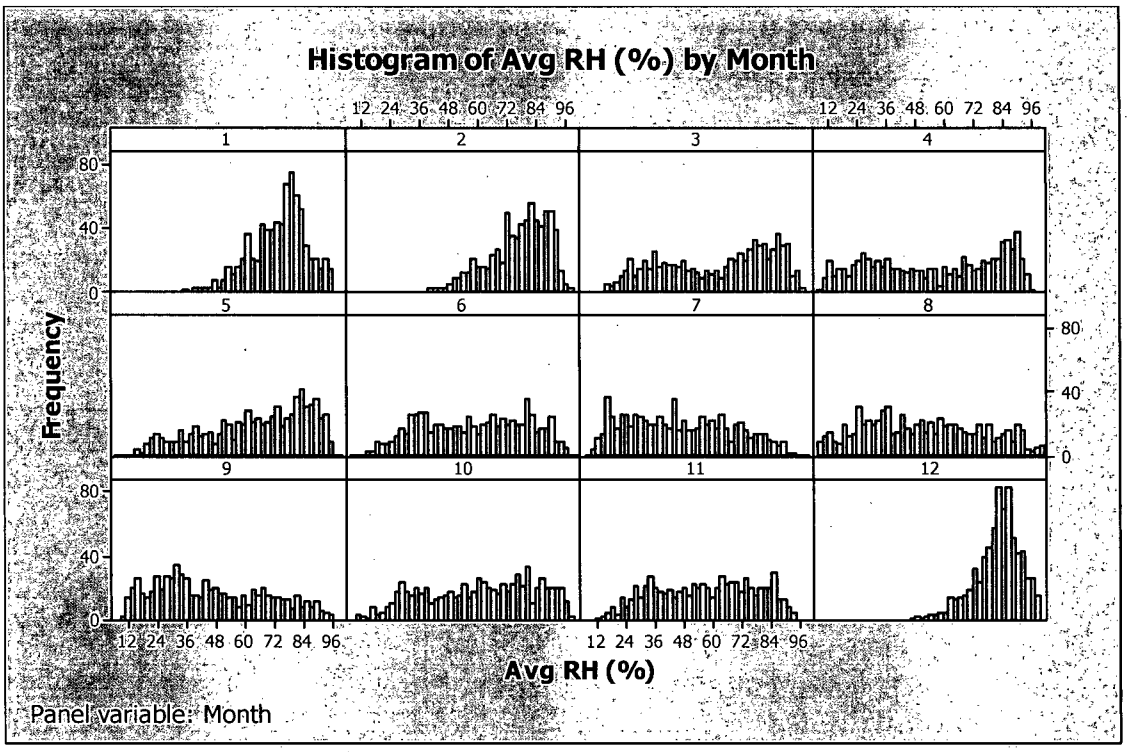
Variable	Season	N	N*	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Lo Temp (F)	1-Spring	2184	0	41.779	13.896	6.000	31.000	41.000	51.000	84.000
	2-Summer	2208	0	70.168	12.644	34.000	61.000	70.000	79.000	102.000
	3-Fall	2184	0	47.162	18.168	0.000	35.000	47.000	59.000	96.000
	4-Winter	2184	0	15.631	13.250	-34.000	7.000	16.000	25.000	52.000

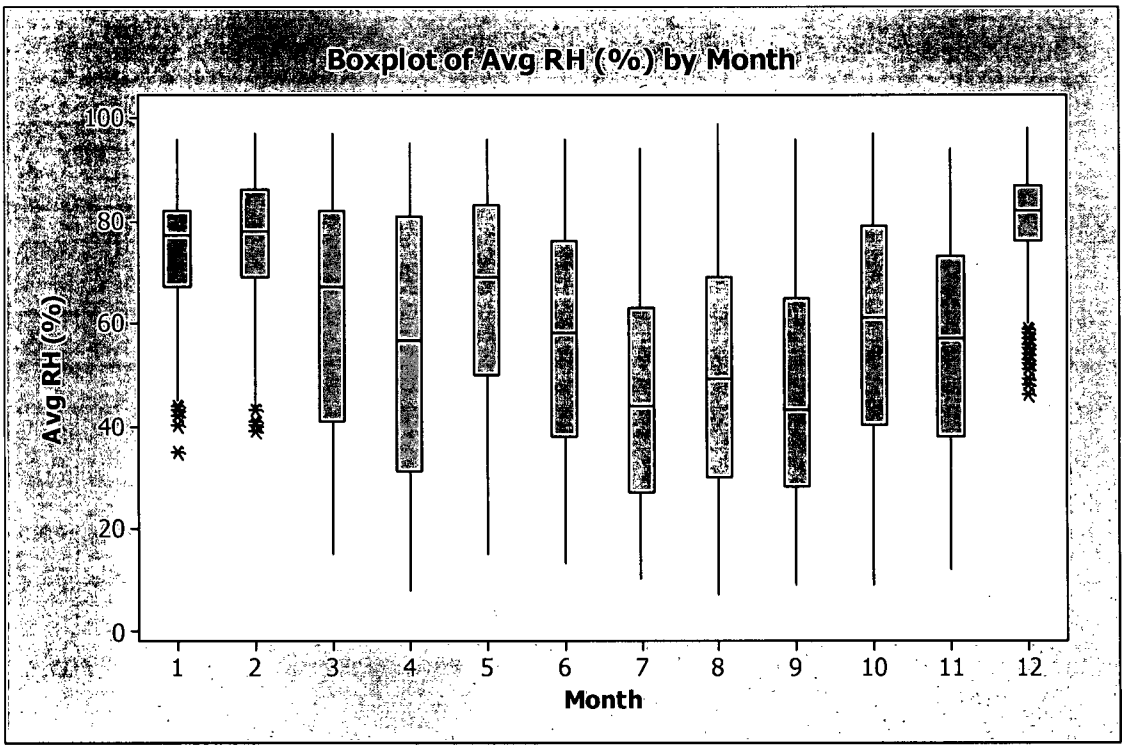

Histogram of Lo Temp (F) by Season
1-Spring
2-Summer
3-Fall
4-Winter
Frequency
Lo Temp (F)
Panel variable: Season


Boxplot of Lo Temp (F) by Season
Lo Temp (F)
1-Spring
2-Summer
3-Fall
4-Winter
Season

Descriptive Statistics: Avg RH (%)

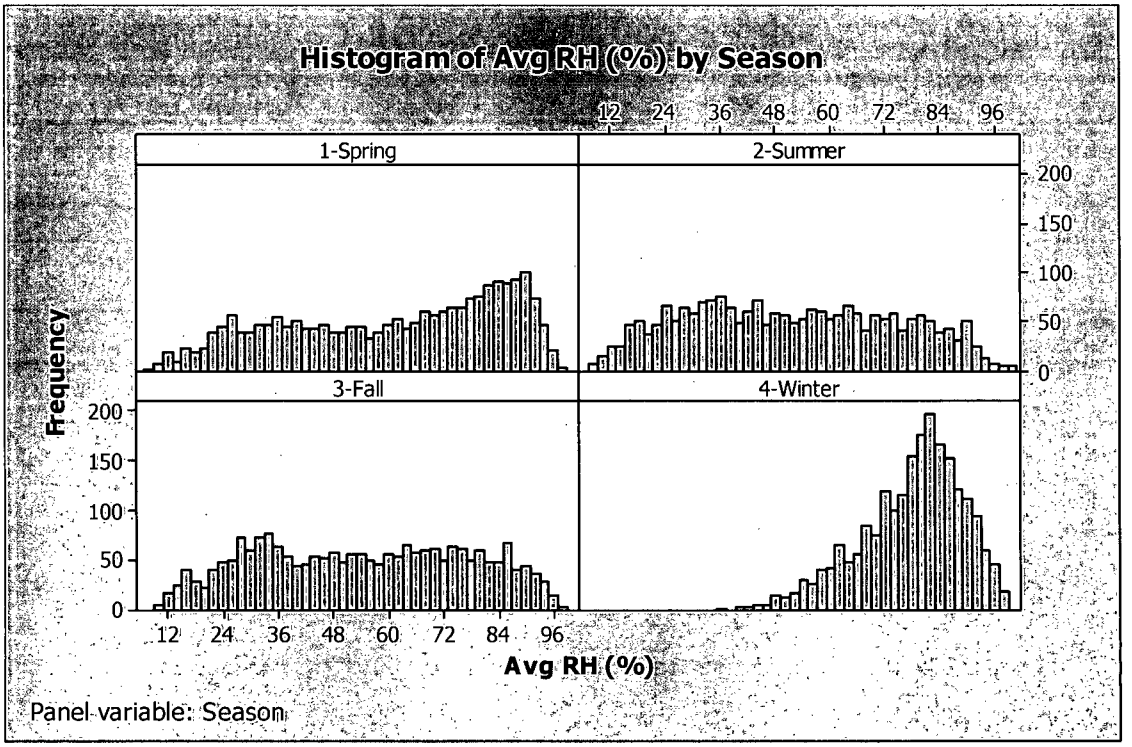
Variable	Month	N	N*	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Avg RH (%)	1	744	0	74.401	11.316	35.000	67.000	77.000	82.000	96.000
	2	696	0	76.204	12.055	39.000	69.000	78.000	86.000	97.000
	3	720	0	61.858	22.846	15.000	41.000	67.000	82.000	97.000
	4	720	0	55.276	26.033	8.000	31.250	56.500	80.750	95.000
	5	744	0	64.849	21.121	15.000	50.000	69.000	83.000	96.000
	6	720	0	57.286	21.158	13.000	38.000	58.000	76.000	96.000
	7	744	0	45.902	21.533	10.000	27.000	44.000	63.000	94.000
	8	744	0	49.981	23.951	7.000	30.000	49.000	69.000	99.000
	9	720	0	46.239	22.786	9.000	28.000	43.000	65.000	96.000
	10	744	0	59.480	22.502	9.000	40.000	61.000	79.000	97.000
	11	720	0	56.265	20.717	12.000	38.000	57.000	73.000	94.000
	12	744	0	80.942	9.595	46.000	76.000	82.000	87.000	98.000

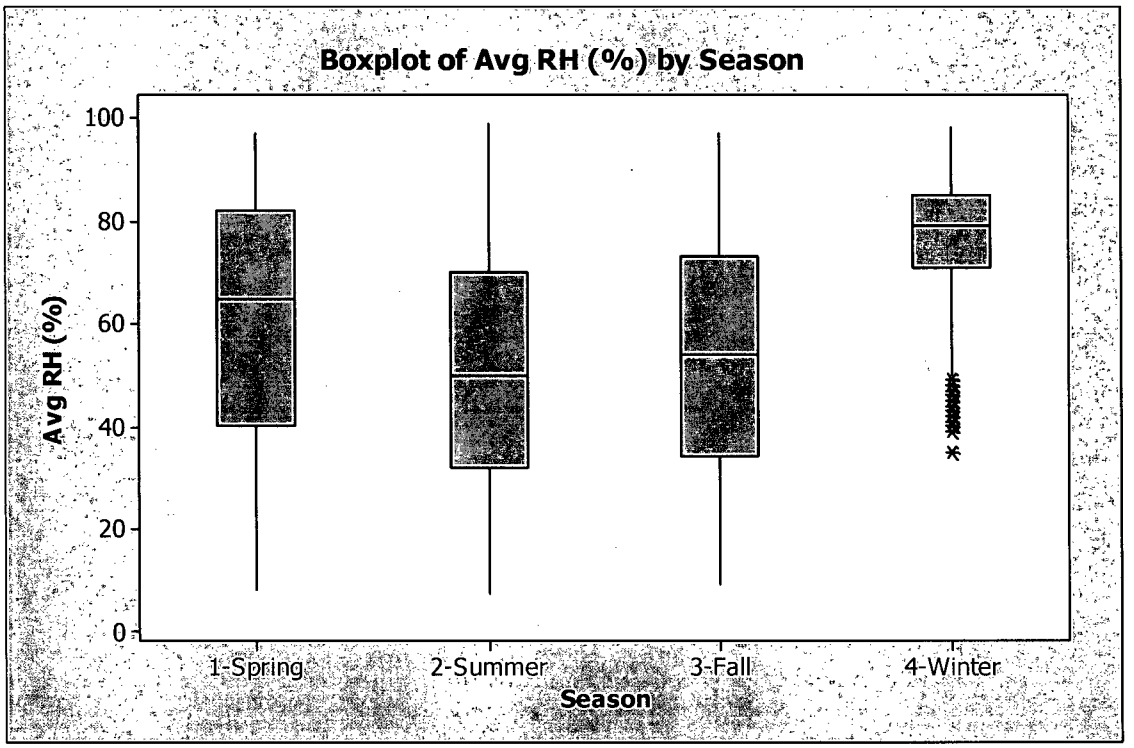




Descriptive Statistics: Avg RH (%)

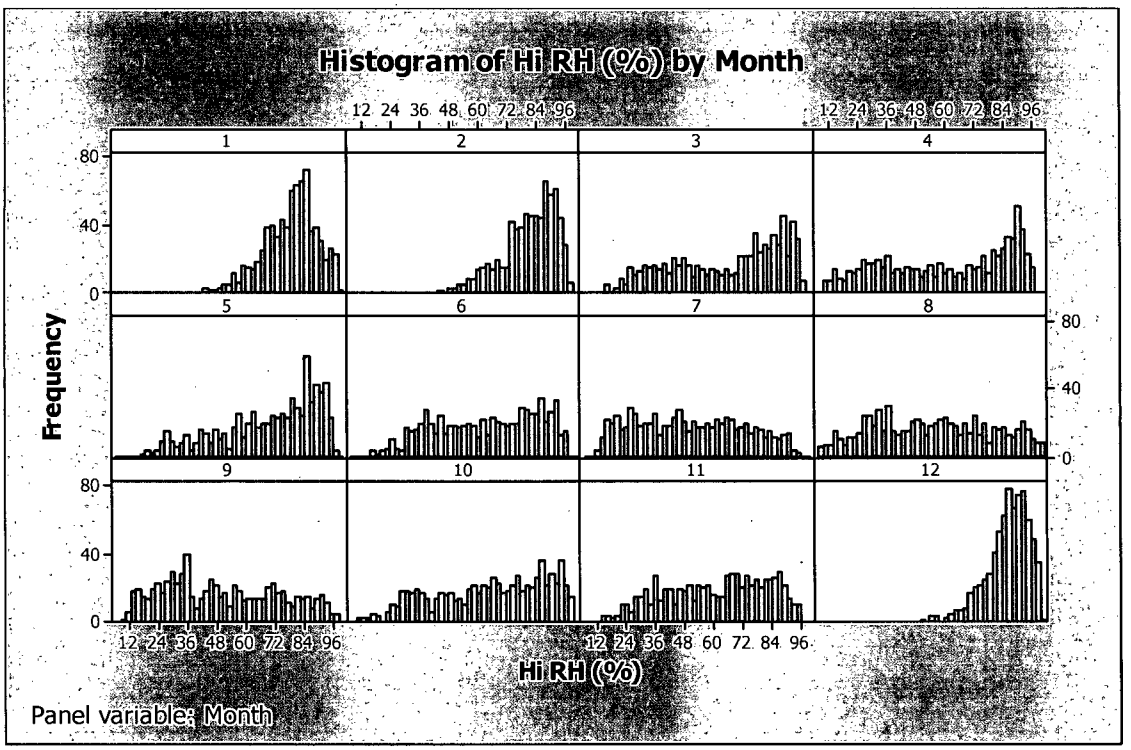
Variable	Season	N	N*	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Avg RH (%)	1-Spring	2184	0	60.707	23.727	8.000	40.000	65.000	82.000	97.000
	2-Summer	2208	0	50.989	22.739	7.000	32.000	50.000	70.000	99.000
	3-Fall	2184	0	54.055	22.726	9.000	34.000	54.000	73.000	97.000
	4-Winter	2184	0	77.204	11.355	35.000	71.000	79.000	85.000	98.000

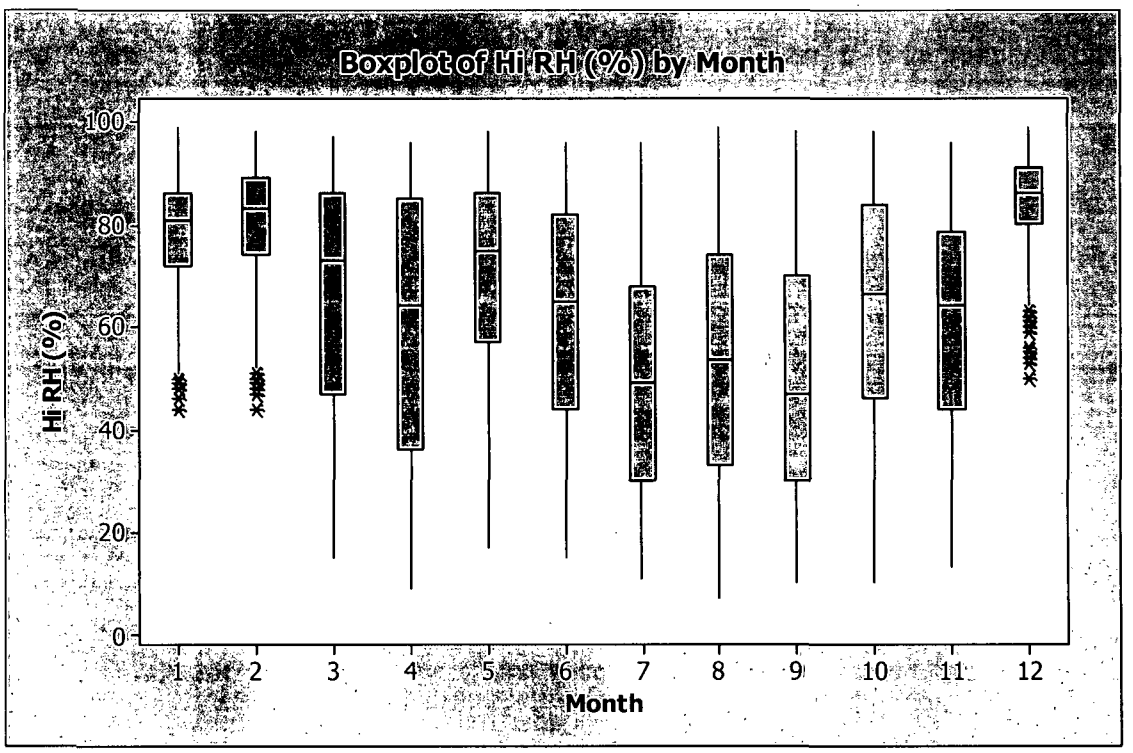

Histogram of Avg RH (%) by Season
1-Spring
2-Summer
3-Fall
4-Winter
Frequency
Avg RH (%)
Panel variable: Season


Boxplot of Avg RH (%) by Season
Avg RH (%)
1-Spring
2-Summer
3-Fall
4-Winter
Season

Descriptive Statistics: Hi RH (%)

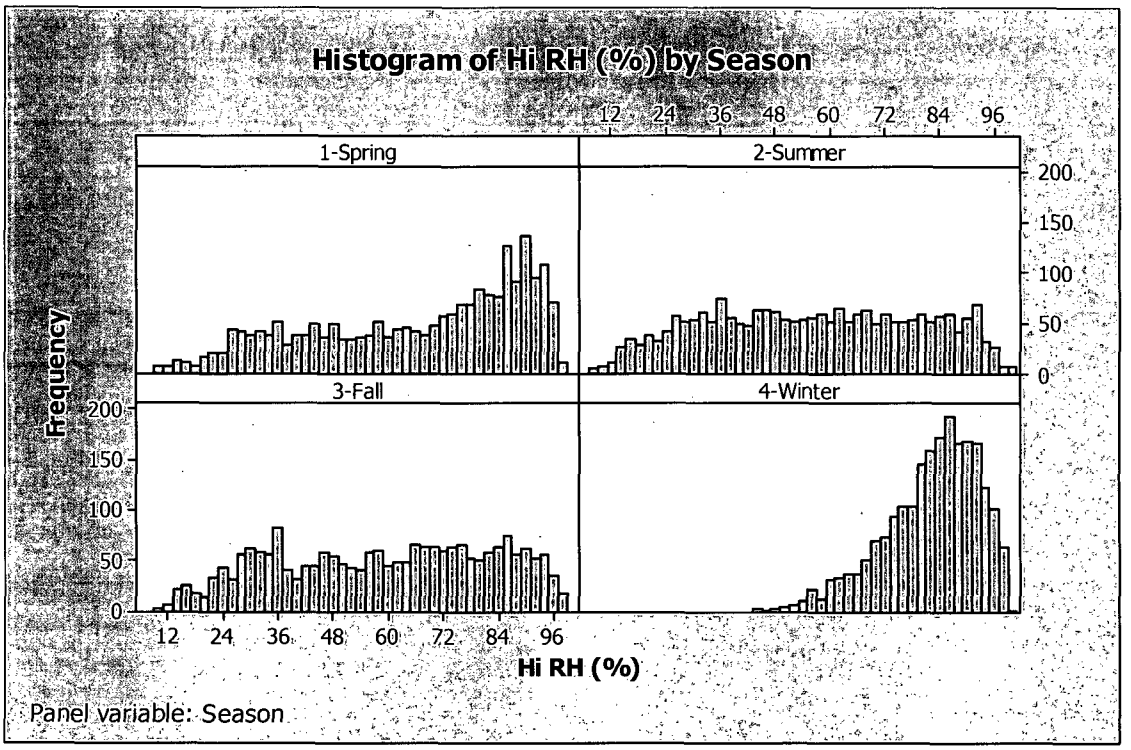
Variable	Month	N	N*	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Hi RH (%)	1	744	0	79.089	10.652	44.000	72.000	81.000	86.000	99.000
	2	696	0	80.704	10.902	44.000	74.000	83.000	89.000	98.000
	3	720	0	66.451	22.568	15.000	47.000	73.000	86.000	97.000
	4	720	0	60.206	26.101	9.000	36.000	64.000	85.000	96.000
	5	744	0	69.940	20.135	17.000	57.000	75.000	86.000	98.000
	6	720	0	62.814	21.013	15.000	44.000	65.000	82.000	96.000
	7	744	0	49.991	22.415	11.000	30.000	49.000	68.000	96.000
	8	744	0	53.909	24.419	7.000	33.000	53.500	74.000	99.000
	9	720	0	50.150	23.648	10.000	30.000	47.000	70.000	98.000
	10	744	0	63.888	22.670	10.000	46.000	66.500	84.000	98.000
	11	720	0	60.954	20.860	13.000	44.000	64.000	78.750	96.000
	12	744	0	84.997	8.711	50.000	80.000	86.000	91.000	99.000

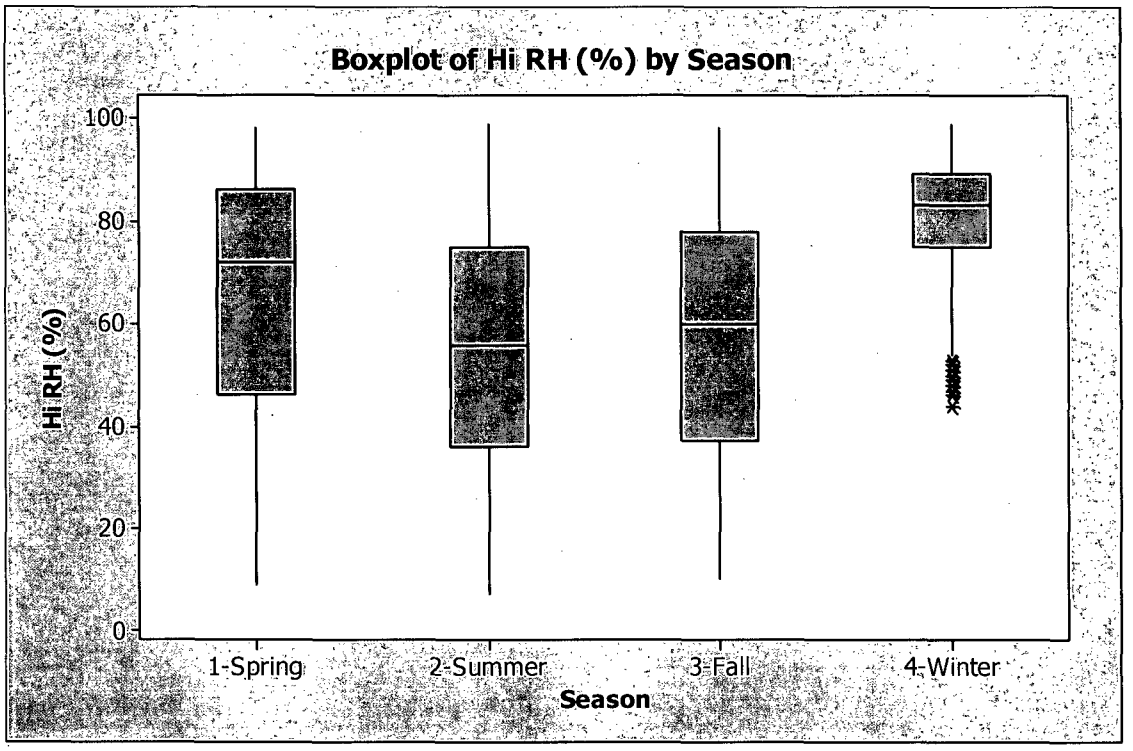




Descriptive Statistics: Hi RH (%)

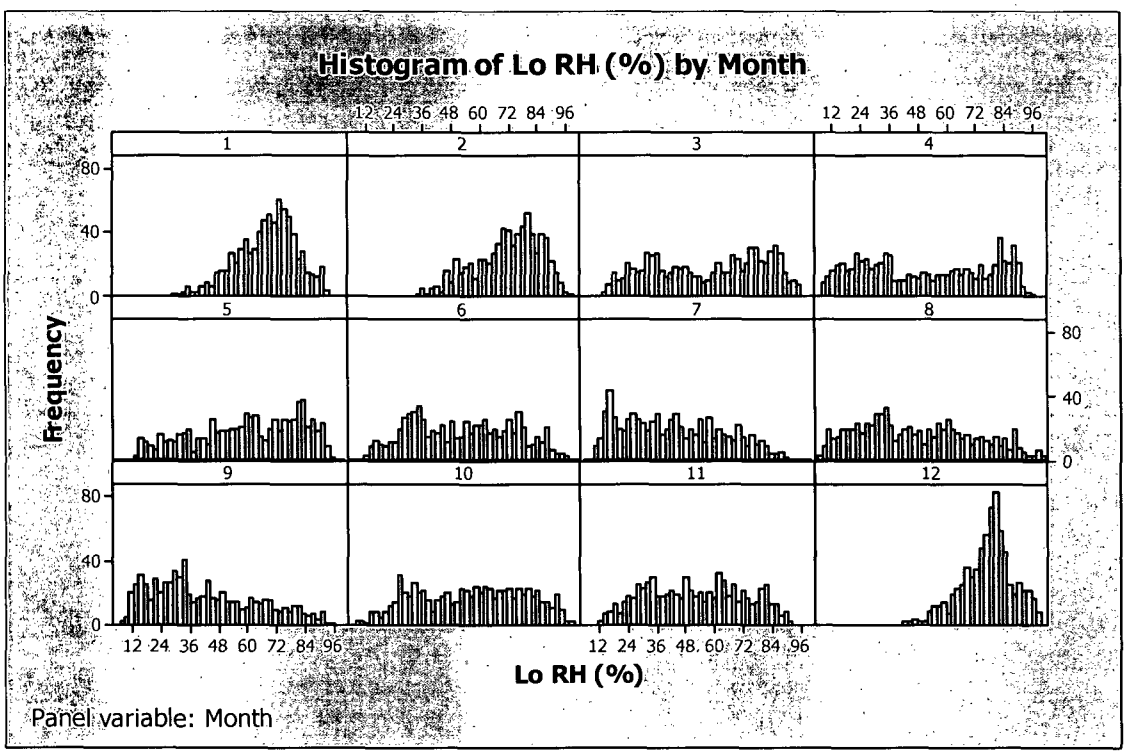
Variable	Season	N	N*	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Hi RH (%)	1-Spring	2184	0	65.581	23.375	9.000	46.000	72.000	86.000	98.000
	2-Summer	2208	0	55.492	23.286	7.000	36.000	56.000	75.000	99.000
	3-Fall	2184	0	58.392	23.180	10.000	37.000	60.000	78.000	98.000
	4-Winter	2184	0	81.616	10.422	44.000	75.000	83.000	89.000	99.000

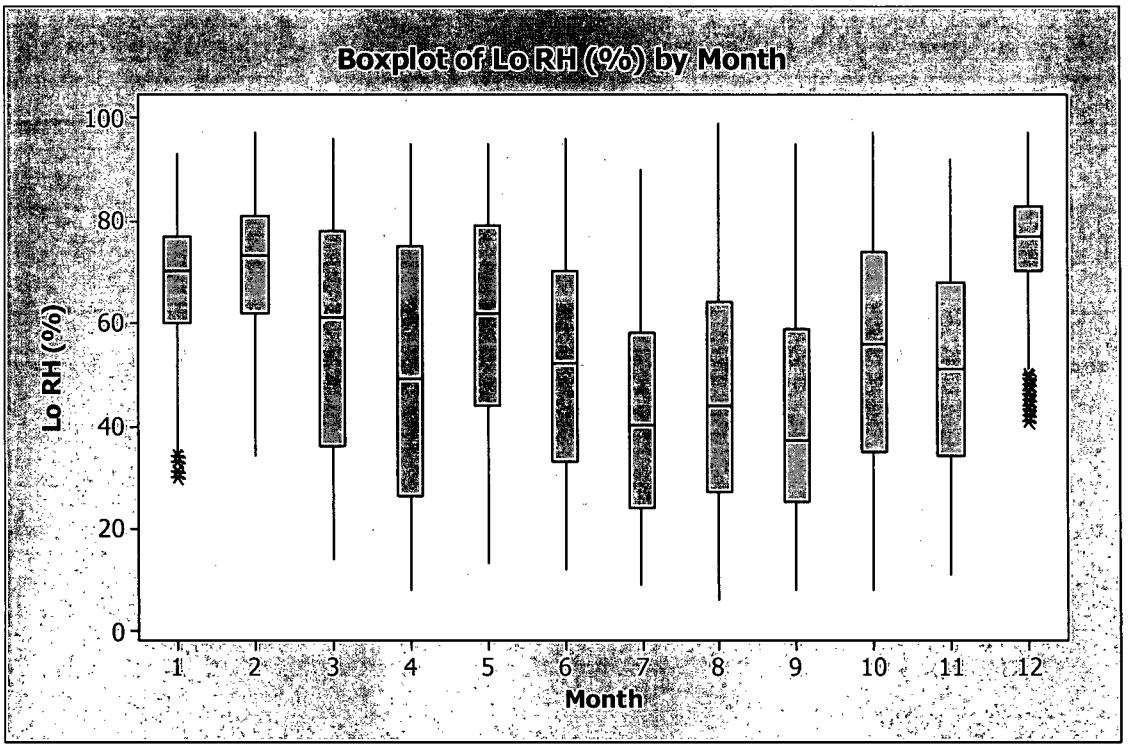

Histogram of Hi RH (%) by Season
1-Spring
2-Summer
3-Fall
4-Winter
Frequency
Hi RH (%)
Panel variable: Season


Boxplot of Hi RH (%) by Season
Hi RH (%)
1-Spring
2-Summer
3-Fall
4-Winter
Season

Descriptive Statistics: Lo RH (%)

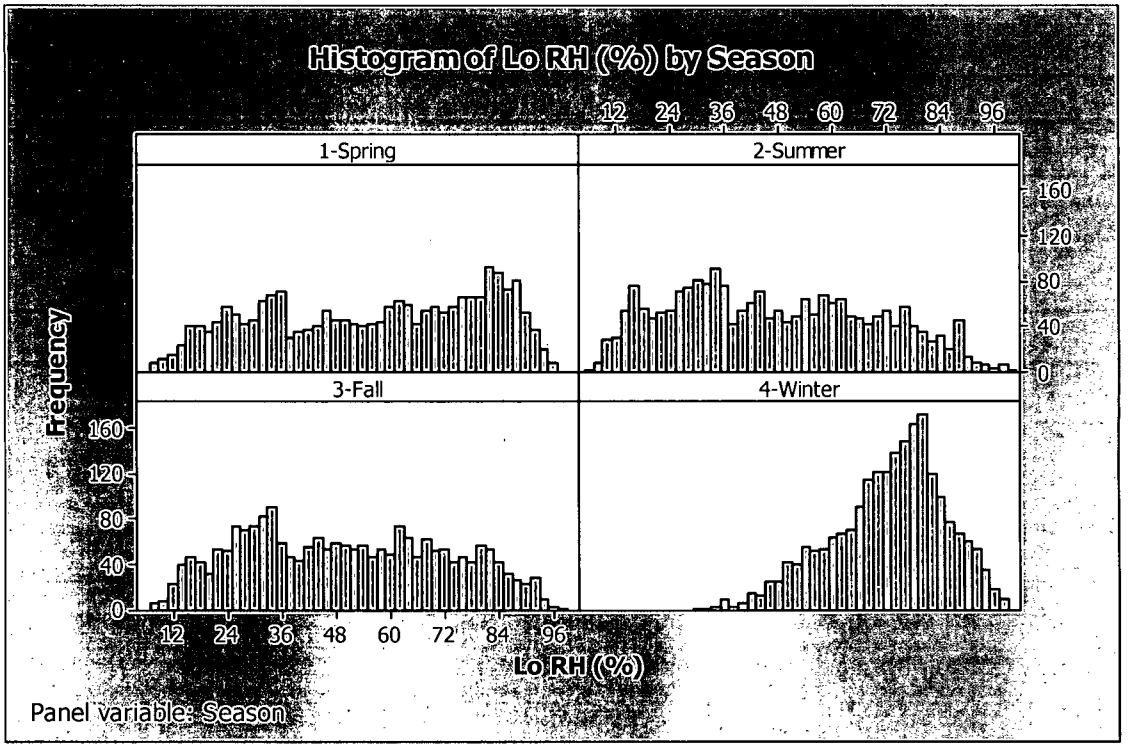
Variable	Month	N	N*	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Lo RH (%)	1	744	0	68.601	12.330	30.000	60.000	70.000	77.000	93.000
	2	696	0	71.119	13.476	34.000	62.000	73.000	81.000	97.000
	3	720	0	57.353	22.974	14.000	36.000	61.000	78.000	96.000
	4	720	0	50.326	25.874	8.000	26.250	49.000	75.000	95.000
	5	744	0	59.954	21.723	13.000	44.000	62.000	79.000	95.000
	6	720	0	51.854	21.077	12.000	33.000	52.000	70.000	96.000
	7	744	0	42.000	20.728	9.000	24.000	40.000	58.000	90.000
	8	744	0	45.991	23.599	6.000	27.000	44.000	64.000	99.000
	9	720	0	42.293	21.856	8.000	25.000	37.000	59.000	95.000
	10	744	0	54.921	22.251	8.000	35.000	56.000	74.000	97.000
	11	720	0	51.574	20.250	11.000	34.000	51.000	68.000	92.000
	12	744	0	75.931	11.041	41.000	70.000	77.000	83.000	97.000

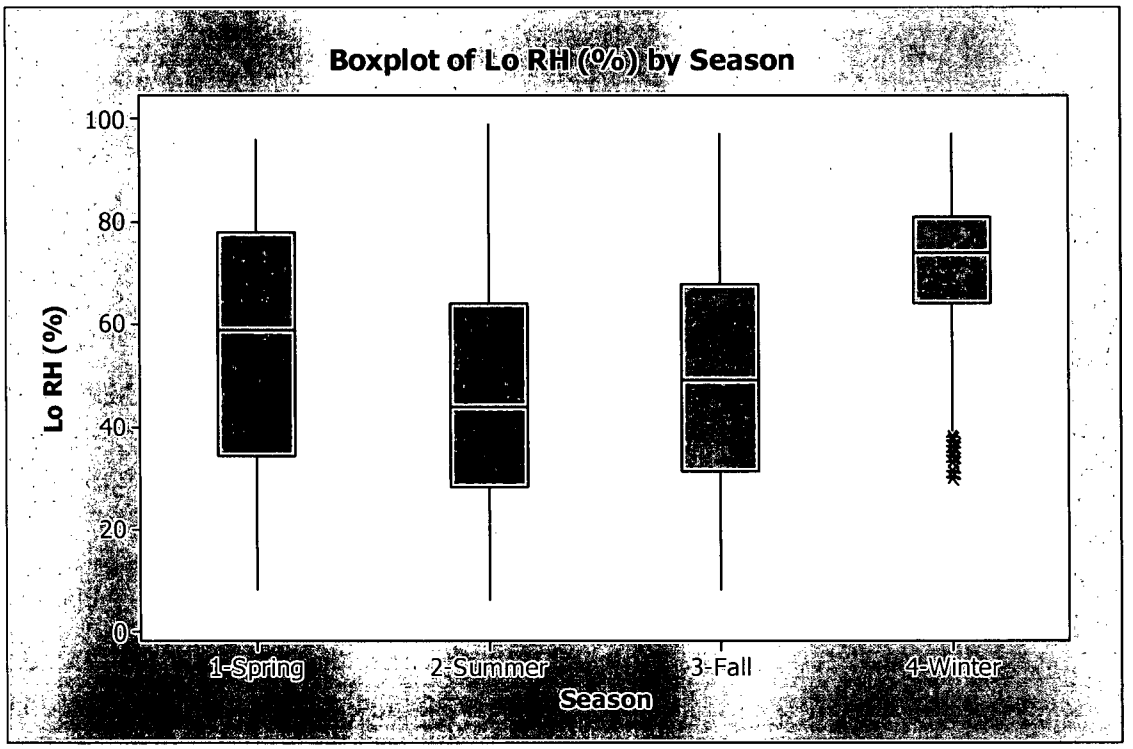




Descriptive Statistics: Lo RH (%)

Variable	Season	N	N*	Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Lo RH (%)	1-Spring	2184	0	55.923	23.906	8.000	34.000	59.000	78.000	96.000
	2-Summer	2208	0	46.558	22.206	6.000	28.000	44.000	64.000	99.000
	3-Fall	2184	0	49.654	22.123	8.000	31.000	49.000	68.000	97.000
	4-Winter	2184	0	71.901	12.669	30.000	64.000	74.000	81.000	97.000


Histogram of Lo RH (%) by Season
1-Spring
2-Summer
3-Fall
4-Winter
Frequency
0
40
80
120
160
12
24
36
48
60
72
84
96
Lo RH (%)
Panel variable: Season


Boxplot of Lo RH (%) by Season
Lo RH (%)
0
20
40
60
80
100
1-Spring
2-Summer
3-Fall
4-Winter
Season

Descriptive Statistics: Precip (Inches)

Variable	Month	N	N*	Sum	Maximum
Precip (Inches)	1	744	0	0.130000	0.050000
	2	696	0	0.210000	0.040000
	3	720	0	0.400000	0.130000
	4	720	0	0.980000	0.330000
	5	744	0	3.80000	0.71000
	6	720	0	1.770000	0.420000
	7	744	0	1.870000	0.460000
	8	744	0	0.870000	0.160000
	9	720	0	0.790000	0.140000
	10	744	0	1.230000	0.220000
	11	720	0	0.100000	0.050000
	12	744	0	0.270000	0.040000