APPENDIX 5.4.5-A

Heritage Baseline Summary Figures

November 2010

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APPENDIX II

Shore Gold Inc.
Star-Orion South Diamond Project
Baseline Archaeological Data

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REPORT

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Executive Summary

Golder Associates Ltd. conducted a Heritage Resources Impact Assessment of the proposed Star-Orion South Diamond Project, located in the Fort à la Corne Provincial Forest. This included the assessment of 10 preliminary project components including the Star Open Pit, Orion South Pit, Overburden Storage, Processed Kimberlite Containment Facility, Coarse Processed Kimberlite Storage, Plant Site, Duke Ravine Reservoir and Polishing Pond, Sewage Lagoon, and Runoff Pond. The objective of the study was to complete an assessment of the proposed project footprint and create a heritage resources site inventory of all known archaeological sites found in potential conflict.

This Baseline Report compiles the data collected as a result of all heritage assessments carried out in the project area between 2004 and 2010. As a result of these assessments, 108 heritage resources have been identified in the proposed Star-Orion South Diamond Mine Project footprint. The sites are dominated by artifact scatters (n=57) and artifact finds (n=47) representing small lithic reduction sites. Two artifact/feature combination sites are also present in the project area. This includes sites that either have a concentration of fire-cracked rock or soil staining that may indicate the presence of a hearth and more intensive camping activities. Eleven of the Precontact sites produced diagnostic projectile points ranging from Early Side-notched to non-distinct Late Side-notched points spanning approximately 7,500 to 300 years ago. The remaining two sites are historic feature/artifact scatter sites consisting of cabin features and refuse dating to the 20th Century.

The 108 heritage resources identified in the proposed project footprint were evaluated and given a heritage significance rating based on their potential interpretive value. The vast majority of sites (N=80 or 74%) are considered to have low potential and no further work is recommended. These sites are considered adequately mitigated through previous assessment programs, collection of formed tools, site mapping, and submission of Saskatchewan Archaeological Resource Record forms to the Heritage Resources Branch. However, the remaining 28 sites are considered to have high (N=9) and moderate (N=19) interpretive potential. These sites were selected based on the presence of a significant surface scatter with the potential for, or evidence of, intact deposits; the presence of a variety of artifact classes or diagnostic tools; or evidence for potential features such as hearths or boiling pits. Additional information regarding Precontact lifeways could be obtained from further excavation at these sites.

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1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by Shore Gold Inc. (Shore Gold) to conduct a Heritage Resources Impact Assessment (HRIA) of the proposed Star-Orion South Diamond Project, located in the Fort à la Corne (FALC) Provincial Forest. Two open pits are being considered, one at the Star Kimberlite and a second potential pit at the Orion South Kimberlite. Both open pits and preliminary locations of associated infrastructure are referenced collectively as the Star-Orion South Diamond Project.

Archaeological surveys were carried out between 2004 and 2008, and again in 2010 in the Star-Orion South Diamond Project area. As a result of these surveys, 108 heritage resources are known to occur within the proposed project footprint. This baseline report summarizes the archaeological work done to date and all known heritage resources found within the proposed project footprint.

Section 2 describes the study area and project footprint. Section 3 provides an overview of the culture history for the region. Section 4 discusses archaeological field survey methods. Section 5 summarizes all archaeological surveys carried out in the project area. Section 6 details known heritage resources, and a summary and evaluation of known heritage resources is provided in Sections 7 and 8 respectively. A table of all sites in conflict with the Star-Orion South Diamond Project is located in Appendix A.

2.0 STUDY AREA

2.1 Project Location and Local Environment

The Star-Orion South Diamond Project is situated approximately 60 km east of Prince Albert, Saskatchewan within the FALC Provincial Forest (Figure 1). The project will encompass several sections immediately north of the Saskatchewan River valley in Townships 49-19 W2M and 49-20 W2M. The FALC Provincial Forest is located within the Boreal Transition Ecoregion. Within Saskatchewan, this ecoregion encompasses an area of some 5,403,000 ha or 8% of the provincial land mass (Acton et al. 1998). This area is an ecological transition zone between the Mid-Boreal Upland and Aspen Parklands Ecoregions, marked by a mosaic of northern and southern species grading from a treeless expanse of grassland to mixed-wood boreal forest.

The Boreal Transition Ecoregion is characterized by rolling aspen (*Populus tremuloides*) covered hills, some white spruce (*Picea glauca*) and jack pine (*Pinus banksiana*), and to a lesser extent, poorly forested level peatlands with black spruce (*Picea mariana*) (Acton et al. 1998). The ecoregion provides forage for a number of large ungulates like moose (*Alces alces*), white tailed deer (*Odocoileus virginianus*), mule deer (*Odocoileus hemionus*), and elk (*Cervus elaphus*) (Acton et al. 1998). Other available species include black bear (*Ursus americanus*), wolves (*Canis lupus*), coyotes (*Canis latrans*), beaver (*Castor canadensis*), and various small mammals. Dominant fish species include northern pike (*Esox lucius*), whitefish (*Coregonus clupeaformis*), walleye (*Stizostedion vitreum*), and perch (*Perca flavescens*) (Scott and Crossman 1973). Areas along the Saskatchewan River, as well as other wetlands within the forest, provide habitat for ducks, geese, and sandhill cranes (*Grus canadensis*) (Saskatchewan Environment 1999).

Figure 1: Location of Proposed Star-Orion South Diamond Project

The study area occurs within the La Corne Plain Landscape Area, which is situated along the Saskatchewan River east of the forks, and includes the FALC Provincial Forest (Acton et al. 1998). The FALC Provincial Forest is 132,502 ha in size. It is 67 km from west to east, 34 km from north to south, and has an elevation of approximately 458 m above sea level (Saskatchewan Environment 1999). The land rises quickly from the Saskatchewan River into plateau-like terrain. The north half of the area is drained by the White Fox River through several small creeks and muskeg draws. The White Fox River marks the transition from the FALC Provincial Forest and agricultural lands. In the central and southern portions, English Creek and several other locally named creeks and muskeg draws drain into the Saskatchewan River.

Within the FALC Provincial Forest, sandy deposits support extensive stands of jack pine. The sandy areas are typified by Brunisolic soils, while the finer textured sand and silty deposits exhibit Gray Luvisolic soils. As a result of the Henderson Fire of 1989, large portions of the forest are in various stages of regeneration. Examples of the common plant communities within the FALC Provincial Forest (Saskatchewan Environment 1999) include the following:

- jack pine/bearberry (*Arctostaphylos uva-ursi*)/rose (*Rosa acicularis*)/lichen
- jack pine/aspen/bunchberry (*Cornus canadensis*)/snowberry (*Symphoricarpos occidentalis*)/feather moss (*Pleurozium schreberi*)/lichen
- aspen/alder (*Alnus* spp.)/currant (*Ribes* spp.)/bedstraw/feather moss
- aspen/white spruce/alder/willow (*Salix* spp.)/twinflower (*Dyschoriste oblongifolia*)/feather moss
- black spruce/labrador tea (*Ledum palustre*)/cranberry (*Vaccinium oxycoccos*)/feather moss
- willow shrub fen/nettle (*Urtica* spp.)/sedge/grass

2.2 Project Description

The proposed Star-Orion South Diamond Project consists of two open pits (Star and Orion South) and associated infrastructure including the Overburden Storage area, Processed Kimberlite Containment Facility (PKCF), Coarse Processed Kimberlite Storage (CPKS), Plant Site, Duke Ravine Reservoir and Polishing Pond, Sewage Lagoon, and Runoff Pond (Table 1; Figure 2). These project components are discussed further below.

Table 1: Star Diamond Project Components

Component	Approximate Size (ha)
Star Open Pit	512
Orion South Pit	378
Overburden Storage	2,247
Processed Kimberlite Containment Facility	494
Coarse Processed Kimberlite Storage	240
Plant Site	37
Duke Ravine Reservoir and Polishing Pond	73
Sewage Lagoon	3
Runoff Pond	6
Total	**3,990**

Figure 2: Star-Orion South Diamond Project Facilities Footprint

2.2.1 Star Open Pit

The proposed Star Open Pit is centered on the Star Kimberlite and is approximately 2.7 km in diameter, 512 ha in size, and will be excavated to approximately 320 m below ground surface. At its nearest point, the southern boundary of the pit will be situated approximately 800 m northwest of the Saskatchewan River.

A drainage referred to locally as the East Ravine bisects the eastern portion of the proposed pit. This spring fed ravine originates approximately 6.5 km north of the Saskatchewan River, where it begins as a shallow draw in the upland, and eventually develops into a broad, deeply incised valley at its confluence with the Saskatchewan River. Numerous beaver dammed ponds are found in the bottom of the valley. The headwater of a second water course, known as the West Ravine, drains a muskeg located near the southwest boundary.

The topography within the proposed pit ranges from gently undulating to hummocky terrain. The well-drained soils support a jack pine forest consisting of dense, regenerating jack pine. Low, moist areas in the ravines and adjoining coulees typically support trembling aspen and a variety of shrubs that result in a more dense vegetation cover. The Star Kimberlite has been the focus of intensive exploration, as a result, much of the proposed Star Open Pit area has been impacted through drilling pads, access roads, bulk sample shaft, and various other infrastructure.

2.2.2 Orion South Pit

The proposed Orion South Pit will encompass approximately 378 ha and is located approximately 5 km north of the Saskatchewan River and 1 km west of the East Ravine. The local topography ranges from gently undulating to hummocky, typical of the stabilized sand dune environment in the area. An unnamed tributary of the East Ravine is found near the northeast boundary of the pit, and a muskeg that forms the headwaters of the 101 Ravine is found toward the south boundary. Vegetation consists primarily of an open floor jack pine forest in varying stages of regeneration, which is attributed to previous forest fires. Aspen and thick shrubs occur along low-lying areas and drainages.

The Orion South Kimberlite area has been the focus of intensive exploration activities. This has resulted in the construction of numerous drill pads and associated access roads, primary access roads (including the Shore Road and 101 Road), the Orion South Shaft operations, and ancillary infrastructure such as water and mud pits.

2.2.3 Overburden Storage

The proposed Overburden Storage area is located to the west of the Star Open Pit. It is approximately 2,247 ha in size and the southern boundary begins 2.3 km northwest of the Saskatchewan River. Overburden from both open pits will be re-deposited at this location.

A drainage referred to as the 101 Ravine is found near the east boundary of the Overburden Storage area. This water course begins as a shallow draw in the upland, where it drains a large muskeg. It then runs approximately north-south for 6 km, then turns at an almost 90 degree angle and heads east for 3 km to the Saskatchewan River. Numerous smaller drainages feed into the ravine, which eventually develops into a broad, deeply incised valley at the confluence with the Saskatchewan River. Numerous beaver dammed ponds are found in the bottom of the valley.

The topography within the Overburden Storage is similar to other areas; however, a ridge of prominent hills is found towards the north boundary. The northern half of this area has been less affected by fires and consists of a mature stand of jack pine with an open, park-like forest floor. Low, moist areas in the ravines and adjoining

coulees typically support trembling aspen and a variety of shrubs that result in a more dense vegetation cover. A broad, low-lying area of muskeg is found along the west side of the 101 Ravine. The Lars Road, an old logging road, passes through the middle of the Overburden Storage area providing access to old harvest blocks, and eventually leads to the Saskatchewan River.

2.2.4 Processed Kimberlite Containment Facility

The proposed PKCF is located northeast of the Star Open Pit. It is approximately 494 ha in size and located 3.5 km north of the Saskatchewan River. An old logging trail passes through the middle of this area that provides access to the Saskatchewan River.

A drainage referred to as the Duke Ravine is found along the western boundary of the area. At the headwaters of this drainage, there is a large muskeg that extends from the creek east to the edge of the existing trail. As the ravine proceeds south, it develops into a significant valley. A tributary of the English Creek is located near the east boundary of the PKCF. Numerous ponds created by beaver dams are found in the bottom of both drainage valleys. The topography between the drainages is generally flat and has been subject to previous forest fires and harvesting activities. The topography of the south half is more rugged with thick regenerating jack pine ridges leading down to a low muskeg area.

2.2.5 Coarse Processed Kimberlite Storage

Located immediately south of the PKCF is the proposed CPKS area. It is approximately 240 ha in size and situated 1 km north of the Saskatchewan River. Most of the area encompasses a large muskeg that serves as the headwaters for local drainages referred to as the FALC Ravine and Wapiti Ravine. The north and west half of the area consists of undulating upland terrain supporting both regenerating jack pine and open grassland areas in remnant harvest blocks. The area to the south consists of a thick aspen and shrub forest that surround the margins of the muskeg, which eventually transitions into mature jack pine in elevated areas rising towards the Saskatchewan River valley crest. Portions of the old Melfort Ferry Road follow along the south and east boundary. At the time of assessment, the FALC Ravine was a dry, shallow draw, while the Wapiti Ravine was deep with standing water.

2.2.6 Plant Site

The proposed Plant Site is located 1 km northeast of the Star Open Pit. It is approximately 37 ha in size and begins 3 km north of the Saskatchewan River. It is located 200 m to 400 m east of the East Ravine valley crest. The terrain is characterized by undulating to hummocky topography that supports thick regenerating jack pine.

2.2.7 Duke Ravine Reservoir and Polishing Pond

The proposed Duke Ravine Reservoir and Polishing Pond are located approximately 1 km east of the Star Open Pit and approximately 1.5 km north of the Saskatchewan River. The reservoir and pond encompass a combined area of approximately 73 ha situated within the Duke Ravine valley. Most of this area consists of the valley bottom and side slopes of the ravine. Vegetation consists of trembling aspen, black spruce and willow in the valley, with open jack pine present on the valley crest.

2.2.8 Sewage Lagoon

The proposed Sewage Lagoon is located immediately southwest of the Polishing Pond. The lagoon will be approximately 6 ha in size and situated 2.2 km north of the Saskatchewan River and 300 m west of the Duke

Ravine. The terrain is characterized by undulating to hummocky topography that supports a mixture of jack pine and aspen.

2.2.9 Runoff Pond

The proposed Runoff Pond is located within the East Ravine approximately 700 m north of the Star Open Pit. It is approximately 4.5 km north of the Saskatchewan River, and will encompass approximately 6 ha of the ravine bottom and valley slope. Vegetation consists of trembling aspen, black spruce and willow in the valley, with open jack pine present on the valley crest.

3.0 CULTURAL SETTING

Prior to discussing the culture history of the project area, it is pertinent to consider the palaeoenvironment and how its evolution through time may have influenced past peoples living in what we know today as the FALC Provincial Forest.

3.1 Fort à la Corne Sand Hills Palaeoenvironment and Geomorphology

Most of the FALC Sand Hills area remained inundated by glacial Lake Agassiz until about 12,700 radiocarbon years before present (rcybp). After this time, the western shoreline of glacial Lake Agassiz was positioned east of the sand hills area, in response to the retreating glacial ice mass (Dyke et al. 2003). Pollen stratigraphy in Saskatchewan suggests that a spruce dominated boreal forest followed the retreating ice, which took place from ca. 15,000 to 12,800 rcybp. Between ca. 13,000 and 10,200 rcybp, the central Saskatchewan boreal forest biomes were replaced by parkland, and then by grassland (Dyke et al. 2004).

This transition was followed by a period of peak aridity in the mid-Holocene. The grassland biome was at its northern maximum extent as early as ca. 9,000 rcybp (Dyke et al. 2004). At this time, the FALC Sand Hills resided on the northern grassland and parkland margins.

Cooler climatic conditions occurred after the mid-Holocene. In southern Saskatchewan, moister conditions are evident between ca. 6,300 and 4,400 rcybp (Vance et al. 1995). A drier and/or warmer period occurred between ca. 2,400 and 1,400 rcybp, with comparatively more humid and/or cooler conditions thereafter, except between ca. 900 to 800 rcybp and in the last ca. 500 rcybp, where warmer and/or drier conditions were evident.

The stabilized parabolic dunes present within the FALC Sand Hills occur over a series of north-south trending ridges that are separated by deeply incised stream valleys terminating at the Saskatchewan River. These ridges were derived from a large glaciolacustrine delta (Saskatchewan Research Council 1987).

Two distinct periods of past dune activity has been elucidated from optical ages derived from stabilized sand dunes in the FALC Sand Hills. Optical dating measures the time elapsed since mineral grains were last exposed to sunlight, which usually corresponds to the time since the grains were buried (Wolfe et al. 2005). The first period of dune activity was in the early Holocene (ca. 12,800 to 8,400 rcybp) during a transition from boreal to parkland-grassland dominated biomes) and the second was in the mid-Holocene (ca. 7,500 to 4,500 rcybp). Both periods are associated, at least in part, with parkland/grassland vegetation cover (Wolfe et al. 2005).

The mid-Holocene dune activity was likely related to a period of increased aridity and associated reduction in vegetation cover via a northward migration of grassland and parkland biomes (Wolfe et al. 2005). Known as the Altithermal or Hypsithermal, this period was characterized by a general increase in temperature and a decrease in available moisture with a corresponding shift from winter to summer dominated precipitation. Lake size and

stream flow decreased significantly (Bobrowsky et al. 1990). Another result of this warming trend was that the Boreal Forest - Parkland border retreated by as much as 100 km north of its present day position.

The onset of a final stable phase by about 5,000 rcybp in the FALC area appears to have been synchronous with the development of Parkland-Boreal vegetation and less arid conditions in the late Holocene (Wolfe et al. 2005). With the recognition that the most recent phase of Aeolian activity in the FALC Sand Hills occurred between 7,500 and 4,800 rcybp, the dunes currently present in this area are considered to be relict, mid-Holocene features.

3.2 Culture History

The southern, mixed-wood boreal forest has been open for human habitation for approximately the last 10,000 years (Burley et al. 1982). Nomadic hunting and gathering cultures moved into what is now central Saskatchewan shortly after the retreat of the Wisconsin continental glacier. Subsequent Saskatchewan prehistory is divided into three major stages: the Early, Middle, and Late Precontact/Woodland Periods (Table 2). While these periods correspond to phases of cultural development that are marked by changes in the weapon systems used, they also reflect complex cultural evolutionary processes.

Table 2: Archaeological Cultures of Saskatchewan

Years Ago	Period	Mixed-Wood and Coniferous Forest Cultures	Northern Plains and Parklands Cultures
1000		Selkirk; Buffalo Lake; Rainy River	Mortlach
	Woodland	Blackduck; Laurel; River House	Old Women's
2000	Late Precontact	Avonlea	Avonlea
		Besant	Besant
3000			Pelican Lake
4000		Plains Influences	McKean
	Middle Precontact	Pelican Lake; Oxbow	
5000		McKean; Early Side-notched	Oxbow
6000			Mummy Cave
7000			Angostura
		Angostura/Nipawin	
8000			Cody
9000	Early Precontact	Agate Basin	Agate Basin/Hell Gap
10000			Folsom
11000			Clovis

Adapted from Meyer (1993) and Dyck (1983).

The archaeology of the southern mixed-wood boreal forest of central Saskatchewan reflects a utilization of the region by both plains-adapted and forest-adapted peoples (Table 2). The prehistory of this region is one marked by influences from the plains cultures to the south and from woodlands cultures to the east. Because of the proximity of the FALC project area to the transition zone between the open grasslands and the boreal forest, vegetation patterns and associated fauna were subject to change during periods of climatic transition. It follows, then, that as the southern edge of the forest migrated in response to these fluctuations, so did the people dependent on the impacted resources.

South of the forest edge along the Saskatchewan River basin, plains adapted groups followed the bison herds through their annual migration cycle. Because of the abundance of plant and animal resources associated with the Saskatchewan River and its tributaries, it would also have been influential in attracting people to the region. Similarly, after the boreal forest migrated south to its modern limits around ca. 2,500 rcybp, forest adapted people would have begun to enter into the Saskatchewan River basin. Later, as populations grew in the eastern woodlands and the technology developed allowing for a more efficient utilization of boreal forest resources, these groups expanded their territory. All pottery producing cultures in Saskatchewan's boreal forest appear to have originated in the east, moving through the mixed-wood boreal forest into what is now Saskatchewan during the last 1,500 years.

3.2.1 Early Precontact Period (ca. 11,500 - 7,500 rcybp)

The Early Precontact Period coincides with the retreat of the Wisconsin continental glacier from northern Saskatchewan (Walker 1999). Current evidence suggests that the glaciers were relegated to far northern Saskatchewan by 9,000 rcybp (Bobrowsky et al. 1990). During the Early Precontact Period, highly nomadic hunting groups are thought to have employed long throwing or thrusting spears to hunt the big game animals of the region. Initially, these hunters focused on an exploitation of the large megafauna of the Late Pleistocene, primarily mammoth. However, with the disappearance of North American Pleistocene megafauna species (Martin 1984), bison became the main prey pursued on the Northern Plains. During the remaining part of the Early Precontact Period, the people relied on an extinct form of bison called *Bison antiquus* for many of their needs. This ancestor to the modern bison was considerably larger than the contemporary species.

Stone spear points associated with occupation during this period are distinctive. They lack notches, are lanceolate in form, and are considerably larger than during later periods. Occupations from this period are rare in the boreal forest region of Saskatchewan and, to date, consist of surface finds. However, when present, the diagnostic artifacts of the Early Precontact cultures are indistinguishable from those identified on the plains.

Clovis and Folsom

Clovis and Folsom projectile points (Figure 3) have precise thinning flakes taken off of the basal end, leaving flutes that facilitate hafting the spearhead to the spear shaft. Evidence from the High Plains indicates that the Clovis culture (ca. 11,500 to 10,900 rcybp) represented a highly nomadic band society who relied on the megafauna of the Late Pleistocene for survival (Frison 1978). Sites that have been excavated in the High Plains in the United States suggest that Clovis people primarily hunted mammoth, although camel, antelope, bison, and other large mammals have also been identified (Agenbroad 1984).

After the extinction of the megafauna in North America, bison became the main source of food. Folsom and later hunters of the Early Precontact Period primarily hunted the larger, extinct forms of bison. There are very few buried sites containing fluted points on the Canadian grasslands, and surface finds of these spear points have not yet been identified in northern Saskatchewan. Clovis points have been recovered near Cold Lake, Alberta.

Figure 3: Regional Chronology Southern Saskatchewan

Agate Basin and Hell Gap

Following Folsom, flutes are no longer found on projectile points. Agate Basin (ca. 10,500 to 9,500 rcybp) and Hell Gap (ca. 10,000 to 9,500 rcybp) points are typically lanceolate in overall form and exhibit grinding on their basal lateral edges to facilitate hafting to spear fore-shafts (Figure 3). Agate Basin points are smoothly lanceolate with straight to slightly rounded basal edges. Hell Gap points are widest at the mid-section. From this point to the base, the lateral edges taper presenting a slightly stemmed appearance (Dyck 1983). In Canada, most of these lanceolate points are found in surface contexts (Walker 1999). The radiocarbon dates associated with their presence on the Northern Plains are based primarily on buried sites that have been excavated in the United States.

The earliest occupation of central Saskatchewan is evidenced by the recovery of a small number of surface collected Agate Basin projectile points. These have been identified in Prince Albert National Park (Forsman 1972) and west and southwest of Nipawin by avocational archaeologists (Burley et al. 1982).

Based on these limited recoveries, it appears that central Saskatchewan at this time was only marginally exploited by a relatively small number of people. While Agate Basin points represent the first movement of people into the boreal forest region of Saskatchewan, it is on a quite sporadic basis.

Cody Complex

Following Agate Basin and Hell Gap, projectile points such as Alberta, Scottsbluff, and Eden (ca. 9,500 to 8,400 rcybp) appear, and are classified together as the Cody Complex (Figures 3 and 4). These projectile points exhibit a stemmed basal morphology to facilitate hafting to a spear shaft. Cody Complex points exhibit fine parallel flaking and a diamond-shaped cross section.

The Heron Eden site, a bison processing area located in southwestern Saskatchewan, is one of the few intact Cody sites found in the province (Corbeil 1995). Radiocarbon dated to 9,000 rcybp, it is also one of the oldest archaeological sites in Canada. The small number of animals represented in the Heron Eden site is consistent with a hunting regime based on stalking methods or the comparatively small communal hunting of 10 to 20 animals. Evidence from kill sites in the High Plains indicates that people took advantage of natural features such as bogs, arroyos, and sand hills to surround and kill the animals (Frison 1978).

Analysis of the features and artifacts collected from the Heron Eden site indicates that people were already familiar with the abundant uses of the bison (Corbeil 1995). Collected tools such as end scrapers are linked to the processing of the bison hide. The hide could be used to make clothing, tents, or various utilitarian items such as bags. Lithic cutting tools such as bifaces were used to remove the meat; especially desirable were the tongue, hump, and shoulder sections. Stone mauls were likely utilized in breaking the long bones to extract the inner marrow. Hearths would be used to cook and smoke the meat. Features and tools such as these would continue to be used for the remainder of the Precontact era in Saskatchewan.

As with Agate Basin/Hell Gap projectile points, few points of this time period have been recovered in central Saskatchewan, and those that have were primarily from a surface context. One Cody site has been identified in the FALC Provincial Forest. A single Cody knife was found on the surface of a trail at FhNe 54 (Golder 2005).

Figure 4: Regional Chronology of the Mixed Wood Boreal Forest of Northern Saskatchewan

Late Lanceolate/Angostura

The latter part of the Early Precontact Period throughout central and east-central Saskatchewan is characterized by a resurgence of lanceolate projectile points similar to the Angostura type (8,500 to 7,500 rcybp). The number of sites identified is suggestive of a more intensive usage of the Saskatchewan River valley area than by previous cultures (McKeand 1995). Classified as the Nipawin phase by Meyer (1977), these projectile points represent the first consistent occupation of the Saskatchewan River valley. They are manufactured from local lithic materials, exhibit grinding on lateral basal edges, have straight to concave bases, and are basally thinned. Unlike more southerly Angostura, these points do not often display parallel oblique flaking or fine craftsmanship, possibly due to the use of local materials such as Swan River Chert (SRC) and quartz (Meyer 1977).

Surface recoveries of these points have been made at five locations in the Nipawin and Gronlid Ferry area: the Windrow site (FhNa 93), Running Elk site (FhNa 41), Breaking site (FhNa 81), Horudko site (FhNb 60), and FhNc 26. Thirteen more have been found in the Carrot River district in close proximity to streams and creeks (Meyer 1970:9-10). Fragments of lanceolate Early Precontact points have also been recovered at 10 sites in the vicinity of the forks of the South and North Saskatchewan Rivers near Choiceland (Wilson 1982), as well as FfNk 7 near St. Louis, Saskatchewan (Amundson et al. 2005).

3.2.2 Middle Precontact Period (ca. 7,500 - 2,000 rcybp)

The beginning of the Middle Precontact Period coincides with the Altithermal Climatic Interval (ca. 7,500 to 2,000 rcybp). During the Middle Precontact Period, projectile points exhibit notches near the basal end, allowing them to be more securely bound to the shaft (Figures 3 and 4). These projectile points are associated with the atlatl, a type of spear thrower (Frison 1978). The atlatl was a major technological advance in that it amplified the speed and thrust of the weapon by increasing the length of the throwing arm. This allowed the hunter to distance himself from the prey.

Along with the atlatl/dart weapon system, the early Middle Precontact Period saw the development of several cultural traits that persisted through the remainder of prehistory (Reeves 1990). Chief among these is the use of large-scale communal hunting methods, which generated large meat surpluses and required complex processing and storage techniques.

Evidence of Middle Precontact Period material culture is quite regularly found in the mixed-wood boreal forest. For instance, components are well represented at aggregating centres such as Pehonan, Nipawiwinihk, and Opaskeweyaw along the Saskatchewan River system (Meyer and Thistle 1995). As this region was part of the Prairie Ecozone during the Altithermal Climatic Interval, the culture history of what is now the southern Boreal Transition Ecoregion is essentially that of the Northern Plains Culture Area through the Middle Precontact Period.

Early Side-notched

The occupants of the Northern Plains during the height of the Altithermal are referred to archaeologically as the Mummy Cave or Early Side-notched series (Figures 3 and 4) (Walker 1992). Evidence of these people is comparatively rare, and date from ca. 7,500 to 5,000 rcybp (Walker 1992). It has been suggested that the decrease in precipitation and the increase in temperatures associated with the Altithermal resulted in a decrease in human and ungulate populations across the Northern Plains (Reeves 1990). Others argue that the Altithermal did not result in a lower population density; rather, the absence of sites from this region is more the result of

changes in climate that were not conducive to the burial and preservation of archaeological sites (Walker 1980 and 1992).

Analysis of the excavated materials from the Gowen sites (FaNq 25 and 32) south of Saskatoon has found the first evidence of pemmican manufacture in the Precontact record dates to Early Side-notched sites (Walker 1992). Pemmican is made by mixing the grease boiled from bison bones with a bison jerky that has been previously pounded into flour. Dried chokecherries and Saskatoon berries could be added for flavouring.

Pemmican will keep for up to two years, thus providing a dependable food source when hunting became more challenging in the late winter and early spring. As well, pemmican served to reduce the weight of food. A single kilogram of pemmican has the nutritional equivalent of 2 kg of meat.

Early Side-notched projectile points have been found at numerous locations in the modern mixed-wood boreal forest. For instance, excavations at the Stuart Lake site (GbNf 6) produced two large side-notched points that form part of the Mummy Cave Complex (Hjermstad 1998). The points were recovered in an occupation that was once a grassland environment (Hjermstad 1998).

Early Side-notched points have been found at 16 sites in the Nipawin Reservoir study area, two of which were found in context (i.e., FhNa 110 and FhNd 16) (McKeand 1995). A total of 13 sites in the vicinity of the Saskatchewan River forks were noted as producing Early Side-notched points, including a buried component at the Below Forks site (FhNg 25) (Kasstan 2004; Johnston 2005). Reconnaissance in Prince Albert National Park has also produced an Early Side-notched projectile point surface find (Forsman 1972).

Oxbow and McKean

Following the Early Side-notched/Mummy Cave occupation of the Northern Plains were the cultures known as Oxbow and McKean. Based on radiocarbon dates for the two complexes, Oxbow and McKean may have been coeval for a period of time on the Northern Plains (Morlan 1993).

Evidence from the excavation of a number of sites from this period suggests a continuing reliance on bison hunting and processing. However, there is for the first time strong evidence that this diet was supplemented by other animals such as antelope, mule deer, rabbit, fox, and waterfowl.

The Oxbow Phase is present on the Northern Plains from ca. 4,700 to 3,000 rcybp (Dyck 1983; Walker 1999). It is identified by the presence of relatively large dart points that have a concave basal edge and broad, shallow side-notches (Figures 3 and 4). The basal corners of the points are rounded, giving them an “eared” appearance. It has been proposed that the Oxbow Phase developed directly from Mummy Cave (Prentice et al. 1983). Oxbow points are found over an expansive territory including the grasslands, parklands, and mixed-wood boreal forest.

One of the defining features of the Northern Plains peoples is the tipi. The first evidence of this feature is found approximately 5,000 years ago during the Oxbow Phase (Balcom and Hoffert 1990). The tipi is recognized archaeologically as stone circles, cobbles arranged in a circle ranging in size from 2 m to 8 m diameter (Kehoe 1960). These cobbles were used to hold down the flaps of the tipi and would be abandoned when the residents left the site. The limited amount of excavation that has been conducted so far at these sites has found only a minor amount of artifacts suggesting that these features were used for brief periods of time by highly nomadic peoples.

Another important feature that first appears during the Oxbow occupation of the Northern Plains is the Medicine Wheel (Calder 1977). Research has identified several forms of these ceremonial structures on the Northern Plains. All Medicine Wheels share two of three common features: a stone circle, a central cairn, and interior or exterior spokes (Brumley 1990). The Medicine Wheel's exact function remains unknown; they may have been used for ceremonies such as the Sun Dance or burials (Grinnell 1922; Brumley 1990).

One of the most important burial sites on the Northern Plains is the Gray site in southwestern Saskatchewan. This cemetery dates between 3,500 and 1,500 B.C. and contains upwards of 300 interred individuals (Wright 1995a). While predominantly an Oxbow burial site, evidence indicates that McKean Complex groups might also have used the cemetery. As Wright (1995a:325) suggests:

> *[n]ot only was the Gray Burial site a Middle Plains culture sacred place where the remains of the deceased were brought for final burial over a period of 2,000 years but the cemetery also likely functioned as a band territorial marker. Its length of use provides some appreciation of the degree of social and territorial stability within the band or bands responsible for the cemetery.*

The Oxbow culture is well represented in the southern edge of the boreal forest. This partially relates to the fact that many of these sites would have been in the grasslands at the time of occupation. However, some researchers postulate that the widespread presence of the Oxbow culture is a reflection that some groups adapted to a forest subsistence strategy, possibly outlasting the plains Oxbow groups (Burley et al. 1982).

Oxbow is the first intensive occupation of the Nipawin area; 14 such sites were identified in a 1976 reconnaissance of the region. Nine more were identified during the 1982 and 1983 reconnaissances, one of which, Hamilton site (FhNc 5), produced buried components (McKeand 1995). Oxbow points are numerous finds in the vicinity of the forks of the North and South Saskatchewan Rivers as well, with 19 being found during the Forks reconnaissance (Wilson 1982). Further north, Forsman (1976) recovered an Oxbow point in a buried context at a site on Montreal Lake (GcNj 2) and on the surface at two nearby locales.

Following the Oxbow Phase was the cultural tradition known as the McKean Complex (ca. 4,100 to 3,100 rcybp). McKean Complex appears across the Canadian grasslands and overlaps in time and space with the Oxbow Phase. It is comprised of two projectile point types known as the McKean and Hanna type dart points (Davis and Keyser 1999). McKean points are lanceolate with a deeply concave base (Figures 3 and 4). Hanna points have extremely large notches or a flared stem, commonly with a basal indentation (Figures 3 and 4).

Like Oxbow, McKean Complex remains have been located within the mixed-wood boreal forest and may represent adaptations to different environmental ecozones (Prentice et al. 1983). Several McKean Complex sites are situated in the vicinity of the Saskatchewan River and southern boreal forest. Thirty-one sites were recorded as containing McKean Complex materials during the Forks reconnaissance (Wilson 1982) while 15 were documented in the Nipawin Reservoir study area (McKeand 1995). For example, McKean and Hanna projectile points have been recovered from occupations at the Crown site (FhNa 86) while Hanna points have been found in excavations at the Broken Axle site (FhNc 81). As well, McKean Complex materials were recovered *in situ* at site GcNj 2 on Montreal Lake (Forsman 1976).

Further recoveries are noted from the James Smith Reserve reconnaissance (Meyer and Klimko 1986) and the Prince Albert National Park reconnaissance programs (Forsman 1972; Gryba 1974).

Pelican Lake

The final culture represented in the Middle Precontact Period is the Pelican Lake Phase (3,000 to 2,000 rcybp). Diagnostic artifacts are based on a wide variety of Corner-notched projectile points (Figures 3 and 4), as well as notched biface and uniface knife forms (Wright 1995b). Bison jumps and pounds are a common Pelican Lake hallmark, as are stone circle features (Burley et al. 1982). Pelican Lake sites have produced exotic materials such as obsidian, Knife River Flint, and native copper indicating the development of relatively far-reaching exchange networks (Wright 1995b).

This culture is significant in that it may be the first on the Northern Plains to utilize the bow and arrow (Brumley and Dau 1988:34). This is recognized archaeologically by a reduction in the size of the projectile point. This reduction, especially around the neck, is a result of the arrow shaft being of smaller diameter than the atlatl dart shaft. The bow and arrow allowed for more effective and efficient exploitation of large mammal species because of its superior rate of fire, range, and accuracy (Reeves 1990). However, it does not appear that the atlatl was fully supplanted by the bow and arrow until midway through the Late Precontact Period.

Based on palynological evidence, the environment in the vicinity of the Saskatchewan River valley during Pelican Lake occupation was that of a mixed-wood forest zone (Prentice et al. 1983). The presence of Pelican Lake material culture has been postulated as a seasonal occupation of the boreal forest fringe by plains adapted bison hunters (Burley et al. 1982). For instance, Meyer (1977) has suggested that Pelican Lake groups along the Saskatchewan River valley near Nipawin were focusing on bison herds, which were available in the upper regions of the river valley at this time, rather than resources within the valley. There are few sites of this culture that have been encountered within the valley itself (Burley et al. 1982).

Corner-notched points are found at nine sites, including three buried components, in the vicinity of Nipawin. These include components at the Gravel Pit site (FhNa 61), the Trail's Edge site (FhNa 107), and the Broken Axle site (FhNc 81). At Montreal Lake, Pelican Lake materials were recovered in buried context at site GcNj 2. Wilson (1982) notes that 27 sites produced Pelican Lake points in the Forks reconnaissance, while reconnaissances on the James Smith Reserve (Meyer and Klimko 1986) and in Prince Albert National Park (Forsman 1972) also identified similar materials.

3.2.3 Late Precontact/Woodland Periods

The culture history of the study region, until the Late Precontact/Woodland Periods and the introduction of pottery, was primarily that of the Northern Plains. It is in the Late Precontact period that the archaeological record shows the first manifestation of boreal forest cultural affinities rather than Northern Plains influenced cultural materials.

This coincides with the expansion of the southern edge of the boreal forest to its modern position and developments in technology and population growth in the Eastern Woodlands. While Northern Plains cultures did continue to utilize the southern edge of the boreal forest on an intermittent basis over the last 2,000 years (Meyer and Epp 1990), the archaeological remains of the region are mainly characteristic of boreal forest adapted peoples. As a result, this portion of the culture history overview is broken into two sections: the Woodland Period of the boreal forest (ca. 1,500 to 200 rcybp) and the Late Precontact Period of the Northern Plains (ca. 2,000 to 200 rcybp).

3.2.3.1 Woodland Period (ca. 1,500 - 200 rcybp) (Boreal Forest Cultural Chronology)

At ca. 1,500 rcybp, cultures adapted primarily to the southern boreal forest environment appear in the archaeological record. Specifically, the Woodland Period is characterized by the introduction of pottery via populations from the eastern woodlands of Manitoba and Minnesota (Meyer 1983). In Saskatchewan, the Woodland period includes Middle Woodland and Late Woodland cultures (Figure 4). Middle Woodland groups produced pottery vessels that were conoidal in form, while Late Woodland groups produced globular or complex profile vessels.

Aside from the introduction and use of pottery and the bow and arrow, boreal forest adapted peoples developed specialized transportation such as birch bark canoes, toboggans, and snowshoes to traverse the region in summer and winter. While these items do not readily preserve in the archaeological record, the wood working tools (i.e., adzes, celts, and wedges) used to manufacture them have (Meyer 1993). Overland travel in the thickly vegetated boreal forest is difficult at best and these groups recognized the utility of following waterways. In fact, most sites in the boreal forest have been identified along the margins of waterways, the proverbial highways of the north.

Woodland Period groups that adapted to life in the boreal forest show a diverse utilization of forest food resources. This includes an annual round based on intercepting seasonal concentrations of certain resources such as fish, migratory waterfowl, and berries. At such times, typically in the spring and fall, large multi-family gatherings called aggregations or rendezvous took place. People would return to the same location over several generations, if not millennia, to engage in trade, economic and social activities, spiritual ceremonies, and to look for suitable marriage partners (Paquin 1999). During the remainder of the year, these large regional bands would break into smaller, extended family groupings to harvest the widespread resources.

Middle Woodland Cultures: Laurel

Laurel ware pottery is the hallmark of the Middle Woodland Period (Meyer 1999). The time-depth of Laurel ware in Saskatchewan is uncertain, though it may have been introduced into eastern Saskatchewan as early as 1,500 rcybp and lasted until ca. 800 rcybp. The Laurel Composite, within which are several regional and temporal complexes, is best known in northern Minnesota and adjacent Ontario and Manitoba, where it is associated with burial mounds, bone tools such as harpoons, native copper artifacts, and stemmed and side-notched projectile points. The earliest dates from the eastern boreal forest for Laurel cluster at ca. 2,100 rcybp (Syms 1977). The widespread occurrence of Laurel ware pottery across Manitoba and into Saskatchewan might be indicative of the development of more efficient means of utilizing boreal forest resources and a concomitant increase in population compared to earlier boreal forest cultures (Meyer 1993).

Laurel ware is typified by conoidal vessels made by the coiling technique with walls that thin towards the lip (Figure 4). Decoration is known to consist of punctates, bosses, and/or cord-wrapped tool, dentate and pseudo-scallop shell impressions. The exterior surface of Laurel ware vessels is smooth (Meyer 1983). Laurel ware components in northern Manitoba and Saskatchewan also produce small side-notched and triangular projectile points.

Laurel ware found in the southern edge of the boreal forest appears to be different from that found deeper in the forest. Specifically, the more southerly pottery exhibits cord-wrapped tool impressed decoration and bossed decoration while the northerly pottery exhibits dentate impressions. Both are Laurel ware, in that they are manufactured by coiling, are conoidal and have smooth exterior surfaces. The southerly Laurel ware is

frequently associated with net impressed pottery and is considered as a constituent of the River House Complex (Meyer 1987 and 1998).

Laurel ware in the southern boreal forest has been identified by Gryba (1974) from a reconnaissance of the Prince Albert National Park, and has also been recovered at the Peterson Creek site (FhNb 72) during the Nipawin Reservoir reconnaissance (McKeand 1995). However, Laurel ware assemblages *per se* are typically a more northerly phenomenon, found on the Churchill, Sturgeon Weir, and Reindeer Rivers (Meyer 1983). Additional recoveries of Laurel ware in the southern boreal forest will be discussed in the context of the River House Complex below.

Middle Woodland Cultures: River House

The River House Complex is contemporaneous with Laurel (ca. 1,000 A.D.), and occurs from the lower North Saskatchewan River valley east to Manitoba (Meyer et al. 2008). The River House Complex occupies a large region of the outer boreal forest of east-central Saskatchewan and west-central Manitoba and includes two pottery wares. One is similar to Laurel ware pottery found further north in Saskatchewan in that it is manufactured by coiling and has a plain surface. However, it exhibits cord-wrapped tool impressions and punctate and boss decoration, but not dentate impressed decorations (Meyer et al. 2008). The second ware exhibits a net impressed exterior surface and a conoidal shape and is identified as Rock Lake ware (Figure 4) (Meyer et al. 2008).

Associated with these two pottery wares are small side-notched and triangular arrow points, small ground celts, and adzes. At present, the River House Complex is dated in a period ca. 800 to 1,200 A.D. (Meyer et al. 2008). In Saskatchewan, therefore, Blackduck would border this culture on the east and south, while Avonlea and/or Old Women's would border it to the west and southwest, and a late form of Laurel would border it to the north. The similarity of this complex to components described in southern Manitoba has led Meyer et al. (2008) to hypothesize that the River House Complex originated in Manitoba.

Several sites have been identified in the southern boreal forest in proximity to the Prince Albert study area that is part of the River House Complex (Meyer et al. 2008). These include components at the Crown site (FhNa 86), River House site (FhNc 6), and the Peterson Creek site (FhNb 72).

Late Woodland Cultures: Blackduck

Blackduck pottery represents the beginning of the Late Woodland Period in Saskatchewan, as recognized by pottery vessels with a globular or complex profile (Figure 4). Blackduck ware (ca. 1,000 to 700 rcybp in Saskatchewan) has a rounded body with gentle shoulders, constricted neck, outflaring upper neck and a vertically oriented sprang/cord impressed exterior surface treatment. Horizontal and diagonal cord-wrapped tool impressions and punctate motifs between the neck and lip of vessels are typical of Blackduck pottery. The Blackduck culture overlaps in time with terminal Avonlea, Laurel, and Besant.

Only a small amount of Blackduck pottery has been identified in Saskatchewan. For instance, shards have been recovered at the Mollberg site (FhNa 1), the Goldsworthy site (FdMw 1), and in the vicinity of Birch Hills at FgNi 50 (Meyer 1998; Meyer and Epp 1990; Prentice et al. 1983). Though it occurs over a relatively broad region, the Blackduck culture is poorly known in the southern Saskatchewan boreal forest and adjacent parkland region (Meyer 1978 and 1998). When found, it occurs with small triangular and side-notched projectile points. Blackduck is more strongly expressed in northern Minnesota, adjacent Ontario, and Manitoba where the pottery

is associated with burial mounds that have produced tubular pipes, harpoons, and copper artifacts (Syms 1977; Meyer 1983).

Late Woodland Cultures: Rainy River

The Rainy River Composite is a grouping of complexes first identified in southern Manitoba, northern Minnesota, and adjacent Ontario. It is primarily comprised of pottery that had been considered as late Blackduck or part of the Selkirk composite (Meyer 1998). At present, three regional and/or temporal complexes have been recognized within the composite: Duck Bay, Bird Lake, and Winnipeg River (Lenius and Olinyk 1990). The Rainy River Composite is hypothesized to have originated from a coalescence of Blackduck and Laurel cultures at ca. 950 rcybp. In Saskatchewan, the Rainy River Composite has been recognized based on Duck Bay ware pottery recovered in eastern and east-central Saskatchewan.

Vessels classified as Rainy River Composite exhibit a complex profile with a globular body, constricted neck, and vertical to outflaring upper necks and vertically oriented exterior surface fabric impressions (Figure 4). Vessels may be either undecorated or decorated. Decoration includes multiple rows of stamps between the lip and shoulder, and lip decoration consisting of notches, cord-wrapped tool, or other tool impressions. The lip thickness of such pots is less than the upper neck thickness. The Rainy River Composite is not well known in Saskatchewan at present and is undated. It may be contemporaneous with materials in the Swan River valley, which have been dated in the 1300s and 1400s (Meyer 1998).

The bulk of the vessels from the Goldsworthy site (FdMw 1), an aggregating location on the Barrier River along the edge of the boreal forest, are reflective of the Rainy River Composite and Duck Bay ware in particular (Meyer 1998). Specifically, Duck Bay Notched, Decorated Lip, and Undecorated type vessels are represented in the assemblage.

Late Woodland Cultures: Buffalo Lake

In northwestern Saskatchewan, a pottery producing culture has been recognized in the Buffalo Narrows region that appears roughly coterminous with Blackduck and Rainy River (Meyer 1999). The material remains of this culture, termed the Buffalo Lake Complex (Young 2006), are represented by both pottery and small side-notched projectile points. Accelerated Mass Spectrometry dating of pottery residue dates the culture to 710 to 480 calibrated rcybp (Young 2006). The pottery, termed Narrows Fabric Impressed Ware, is commonly conoidal to slightly globular with subtle shoulder and neck inflections (Figure 4). The vessels are primarily sand tempered with sprang fabric exterior surface treatment. Decoration is limited to an exterior encircling line of punctuates on or above the neck and a variety of tool impressions on the lip surface or interior edge. Although currently only recognized in the headwaters of the Churchill River, this complex shares traits with both Selkirk and Rainy River Composites, and may have an as yet unrecognized distribution that extends further across the southern boreal forest of Saskatchewan.

Late Woodland Cultures: Selkirk

The Selkirk Composite (ca. 650 to 200 rcybp) is a grouping of regional pottery complexes in the mixed-wood boreal forest across northern Ontario, Manitoba, and Saskatchewan. In general, globular vessels exhibiting a twined textile impressed exterior and grit tempered, commonly laminated paste typify Selkirk ware. A single row of punctate decoration around the vessel neck or upper neck, as well as lip decoration of cord-wrapped and other tool impressions occurs on a high percentage of Selkirk ware vessels (Meyer and Russell 1987). This suite of decorative traits, particularly the punctate row, on simple globular vessels is the basis of the most

common vessel type of the Selkirk Composite - the Clearwater Lake Punctate type (Figure 4). This type occurs in high frequencies for all complexes. Small side-notched and triangular projectile points, bone tools, and ground stone tools are commonly found in Selkirk components.

Selkirk components are widespread throughout the boreal forest of Saskatchewan and four complexes have been identified to date: Clearwater Lake, Grass River, Kisis, and Pehonan (Paquin 1995). Given the extensive occurrence of Selkirk ware in the boreal forest, and recognition of several complexes, it has been postulated that the Selkirk Composite represents a significant population increase in the boreal forest compared with preceding Laurel and Blackduck periods (Meyer 1978).

The two complexes present in central Saskatchewan are Clearwater Lake and Pehonan. Components of the Clearwater Lake Complex are noted over a wide area in the southern boreal forest. Investigations along the Churchill, Reindeer, and Sturgeon Weir Rivers, Lac La Ronge, and Montreal Lake have resulted in the discovery of pottery-bearing sites dominated by the Clearwater Lake Punctate type (Meyer 1978; Wilson and Light 1980; Forsman 1976).

The Pehonan Complex is the most southerly of the Selkirk composite, identified primarily from spring/summer sites along the Saskatchewan River valley. In addition to producing vessels with the above morphological attributes, pottery from Pehonan components exhibit morphological traits such as angled shoulders, and angled and S-rim profiles. Decorative traits, such as fingernail/finger pinching and interior punctates are also noted (Meyer 1981). These traits are hypothesized as the result of sharing ideas with Northern Plains pottery making groups, such as Mortlach, during long-distance visiting along the southern edge of the boreal forest (Meyer 1981). While present in small amounts, plains pottery is present in components with Selkirk ware further indicating a connection with southern groups.

Associated with the pottery are small side-notched or triangular points, ground stone adzes, ground mauls, notched schistose slabs, and bone harpoons (Meyer 1981 and 1983). The presence of materials such as Knife River Flint indicates a connection with southern groups. Northern Mortlach sites also show evidence of Selkirk traits (i.e., syncretism) or contain Selkirk rim shards. In general, evidence does not point to an overlap of territories for these two cultures but, rather, long-distance visiting and inter-marriage. Selkirk groups, specifically those who produced Pehonan pottery, gathered at large fisheries on the Saskatchewan River in the southern forest edge during spring and early summer then wintered deeper in the boreal forest, while Mortlach groups wintered in the parklands and spent summers hunting bison on the grasslands.

Large scale excavations at the Bushfield West site (FhNa 10) in the vicinity of Nipawin suggest that Pehonan Complex groups made use of the Saskatchewan River valley during the spring and utilized numerous food resources while camped at this fishery (McKeand 1995). For instance, the remains of bison, moose, elk, bear, canids, mustelids, rabbits, and hares, migratory waterfowl and game-birds, and numerous fish species were recovered from excavations at FhNa 10. It has been noted that many large Selkirk Composite sites have been located at major fisheries and contain great amounts of pottery (Meyer 1993).

Other sites that have produced Selkirk materials along the Saskatchewan River valley include Mollberg (FhNa 1), Francois (FhNa 3), Bushfield East (FhNa 13), and Lloyd (FhNa 35) (McKeand 1995). Sites FgNe 6 and 11, identified in the James Smith Reserve reconnaissance (Meyer and Klimko 1986) may be associated with an aggregating centre in the FALC area.

Aggregating centres are sites at which members of several regional aboriginal bands assembled on an annual or semi-annual basis for intensive social interaction and religious ceremonies (Meyer and Thistle 1995). Six of these have been documented in the Saskatchewan River valley. The aggregating centre in the FALC area was named Pehonan or "the waiting place" and was part of the landscape utilized by the Pegogamaw Cree (Meyer and Thistle 1995; Meyer and Russell 2004).

The distribution of sites or components containing Selkirk materials is thought to signify occupation of the mixed-wood boreal forest by the ancestors of the historically known Western Woods Cree. Selkirk Composite sites, some with Euro-Canadian artifacts, are found in areas the Cree inhabited at the time of contact with Euro-Canadians traders and explorers (Ray 1974; Russell 1991). There is also historic, ethnographic, and linguistic evidence of the Cree's familiarity with ceramics (Meyer 1987; Paquin 1995).

3.2.3.2 Late Precontact Period (ca. 2,000 - 200 rcybp) (Northern Plains Cultural Chronology)

The beginning of the Late Precontact Period (2,000 to 200 rcybp) on the Northern Plains coincides with slightly cooler and moister conditions (Vance 1991). This period is marked by the introduction of pottery and the final replacement of the atlatl by the bow and arrow (Meyer and Hamilton 1994). There was also a significant intensification of bison communal hunting on the grasslands during this period (Reeves 1990).

Ceramic vessels make their first appearance in the Saskatchewan grasslands at ca. 1,900 rcybp (Scribe 1997; Meyer and Rollans 1990). This technology was likely introduced from the Eastern Woodlands/Missouri River region (Dyck 1983). As with the pottery of the boreal forest, Northern Plains ceramics were unglazed, manufactured by hand and fired in open fires. Pottery vessels were often decorated with incisions or impressions in the clay on the upper portion of the containers.

The parkland belt was a zone of seasonal use by groups adapted to the grasslands to the south; in some instances these groups interacted with forest adapted cultures. This is evidenced by the presence of archaeological remains of Late Precontact Period plains cultures that followed migratory bison herds into the aspen parkland during the winter. To this end, Meyer and Epp (1990:323) present the following hypothesis:

> *The predominant Late Precontact human occupation of the central Saskatchewan parklands was by plains bison hunters, with cultural contact between plains and boreal forest peoples usually restricted to the southern edge of the forest.*

Others disagree, arguing that the boreal forest was used exclusively by the Woodland Cultures (Malainey and Sheriff 1996).

For some boreal forest adapted groups, little or no interaction occurred with the plains cultures, possibly due to a seasonal cycle that distanced them from the cultures entering the forest. In other instances, interaction occurred in the form of long-distance visiting and trading, though the participating cultures' territories did not necessarily overlap (Meyer and Epp 1990). Forays and interactions such as these are known to have occurred along major river systems such as the North Saskatchewan and the Saskatchewan.

Late Precontact Period: Besant

The Besant Phase existed from ca. 2,000 to 1,150 rcybp and has been characterized as containing Besant Side-notched projectile points and cord-roughened or smooth conoidal pottery vessels decorated with punctates

below the lip (Figure 3). The earliest pottery recovered on the Northern Plains occurs in Besant occupations (Meyer and Rollans 1990; Scribe 1997). Syms (1977) notes that Besant assemblages are often dominated by the lithic material Knife River Flint, a material only available from North Dakota. Besant habitation structures include the tipi and the wickiup. Besant is a transitional phase between the Middle and Late Precontact Periods because, though pottery use is evident, Besant Side-notched projectile points (Figure 3) are typical of atlatl darts, not arrows (Dyck 1983).

The Besant peoples were highly efficient communal bison hunters. Reeves (1990) has gone so far as to call the Besant period the fluorescence of bison hunting on the Northern Plains. The Besant people were very successful at killing mass numbers of bison in operations that must have involved the cooperation of hundreds of people. As this form of hunting entails the collaboration of a number of different bands, it is the strongest evidence yet that tribal leaders had emerged, if only for a temporary amount of time.

The Besant culture utilized at least two forms of communal hunting techniques, bison jumps, and bison pounds. At the bison jumps such as the Gull Lake site (EaOd 1) in Saskatchewan, bison were run off the edge of cliffs (Kehoe 1973). Pound sites such as Fitzgerald (ElNp 8) in central Saskatchewan employed a temporary corral where the bison could be gathered and killed (Golder 1996). The animals would be funnelled into the corral or over the cliff by hunters arranged along the edge of long drive lanes. Processing sites indicated that bison were heavily utilized for their meat, marrow, and grease (Golder 1996; Clarke et al. 1997).

Besant sites and artifacts are found across the aspen parkland and into the boreal forest edge (Meyer and Epp 1990). Eleven sites documented during the Forks reconnaissance were identified as Besant (Wilson 1982), while eight were noted in the Nipawin vicinity. One of these sites, Boggy View (FhNa 111), produced Besant points in buried context (McKeand 1995). The difficulty in assigning surface sites to the Besant Phase is that points found out of context look remarkably similar to Mummy Cave Series Side-notched points. Besant pottery appears to be restricted to the grasslands, with one occurrence noted in the northeastern portion of the parklands at the Mudrick Springs site (Meyer and Rollans 1990).

Late Precontact Period: Avonlea

At ca. 1,750 rcybp, the Avonlea Horizon appears across the Saskatchewan grasslands and into the edge of the boreal forest, overlapping in time with the Besant culture. It is during this period that the prehistory of the southern boreal forest region exhibits material culture and adaptations separate from the grasslands. Avonlea hunters appear to be the first culture on the Northern Plains to exclusively use the bow and arrow (Figure 3). Avonlea ceramics are typically conoidal and sparsely decorated (Figure 3). When present, decoration consists of a single row of punctates, cord-wrapped tool, or incised marks along the rim of the vessel just below the lip. There are four Avonlea wares recognized in Saskatchewan - Rock Lake (net impressed exterior), Truman (parallel grooved exterior), Ethridge (cord-roughened exterior), and Avonlea Plain (Walde and Meyer 2003).

Meyer and Walde (2009) have proposed that the traditional Avonlea Phase be re-examined as a Horizon composed of four regional phases: Morkin, Upper Kill, Sjovold, and Lebret. This is based on the co-occurrence of four pottery wares with Timber Ridge Side-notched projectile points in Manitoba, Saskatchewan, Alberta, Montana, and North Dakota. For the purposes of this culture history overview, the Lebret Phase will be discussed. The remaining three phases are more typical of open grassland occupations.

The Lebret Phase of the Avonlea Horizon consists of sparsely decorated Rock Lake Ware found in parkland and southern boreal forest sites in Manitoba and Saskatchewan. Rock Lake Ware is pottery with a conoidal

morphology exhibiting a net-impressed exterior surface that is commonly undecorated but is known to possess a single row of punctates impressed below the lip. The bands that produced this material culture followed a seasonal round that included utilizing bison as well as fish (Meyer and Walde 2009).

While highly successful bison hunters, Avonlea groups did not seem to have relied as heavily on the bison for subsistence as earlier cultures on the Northern Plains. Saskatchewan Avonlea sites such as Hartley (Clarke 1995), Lebret (Smith and Walker 1988), and Long Creek (Wettlaufer 1960) contain a wide variety of faunal species. For instance at the Hartley site (FaNp 19), wolf, dog, coyote, fox, jackrabbit, snowshoe hare, badger, a variety of rodents, and waterfowl and fish were hunted and consumed (Clarke 1995). The Lebret site, for which the Lebret Phase is named, is an Avonlea fishing location in the Qu'Appelle valley (Smith and Walker 1988).

Avonlea Horizon sites producing Rock Lake ware have been identified at several locations in the northern parkland/southern boreal forest of Saskatchewan. These include collections from the Birch Hills/Muskoday Reserve area and excavated artifacts from the Gravel Pit site (FhNa 61), Wallington Flat site (FhNa 112), and Mineral Creek site (FhNc 53) (Meyer and Walde 2009). Avonlea (Timber Ridge Side-notched) points have also been recovered from sites in the Nipawin vicinity, on the James Smith Reserve, in Prince Albert National Park and the Forks region (Burley et al. 1982; Forsman 1972; Meyer and Klimko 1986; Wilson 1982).

Rock Lake ware has been excavated from sites along the Saskatchewan River valley in association with a southern variety of Laurel ware at the River House, Peterson Creek, and Crown sites, but not with Timber Lake Side-notched points. In this regard, the net impressed pottery is considered part of the River House Complex and separate from the Avonlea Horizon represented in the above mentioned sites (Meyer et al. 2008).

Late Precontact Period: Old Women's Phase/Prairie Side-notched

The last 1,200 years on the Northern Plains were dominated by the Old Women's Phase (Reeves 1983). One of the principal hallmarks of the Old Women's Phase are buffalo jumps. Sites like Gull Lake (Kehoe 1973), Head-Smashed-In (Brink and Dawe 1989), and Old Women's (Forbis 1962) exhibit extensive use over the last 1,600 years. Bison pound sites are also recognized from this time period and in Saskatchewan include Tschetter (Linnamae 1988) and Estuary (Adams 1977).

Old Women's Phase camp sites such as Mortlach (EcNl 1) "*consist of massive middens of macerated bone, fire-cracked rock, numerous hearths, and boiling pits*" (Reeves 1990:170). The sheer density of heavily butchered faunal deposits from these sites suggests that the primary motive for the hunt was the processing and redistribution of large caches of food, what Kehoe (1973:195) has termed the "industrialization" of the hunt. Old Women's Phase occupations are widely distributed across southern Saskatchewan (Walker 1999), with a limited presence in the northern parkland-southern boreal forest interface (Wilson 1982; Meyer and Epp 1990).

Old Women's Phase components in Saskatchewan dating between 1,200 and 650 rcybp have produced Prairie Side-notched projectile points (Figure 3) in association with globular cord roughened or textile impressed pottery (Meyer 1988; Walker 1999). Prairie Side-notched points (Figure 3) are small, crudely made points with shallow side-notches located close to the basal edge (Dyck 1983). Plains Side-notched points (Figure 3) replace Prairie Side-notched points in late Old Women's Phase occupations dating to between 700 to 200 rcybp. Plains Side-notched points are well made triangular points with square bases and deep narrow side-notches.

Pottery associated with early Old Women's Phase components is globular with rounded or angular shoulders and somewhat flattened bases (Figure 3) (Meyer 1988). Vessels have thick, often blocky walls with cord-wrapped paddle impressed, fabric-impressed or, less frequently, smoothed exteriors. These pots are occasionally decorated, usually with punctates, incised lines, or cord-wrapped tool impressions between the lip and shoulder apex. After 650 rcybp, these vessels are found only in the Alberta and the western Saskatchewan plains (Meyer 1988).

Although Old Women's Phase pottery has been previously identified from a handful of sites in the boreal forest (Meyer 1988; Paquin 1995), these identifications have been reconsidered and are now regarded as woodland pottery (Young 2006). Instead, Old Women's Phase pottery is more likely to be recovered from parkland sites such as Lucky Strike (Wilson 1984) and Hartley (Clarke 1995) and across the grasslands. It appears then, that the Old Women's Phase occupation of the southern forest region was tentative.

However, small side-notched points have been recovered from numerous sites along the North Saskatchewan and Saskatchewan River valleys and throughout the southern boreal forest. Given the widespread use of these culturally ambiguous points during the last 1,000 years by several pottery producing groups, designating such finds as part of the Old Women's Phase must be done with caution when not recovered in association with pottery.

Late Precontact Period: Mortlach Phase/Plains Side-notched

From 650 A.D. through to the protohistoric period, Old Women's Phase components are not well represented in Saskatchewan. Instead, Plains Side-notched projectile points (Figure 3) are usually found in association with Mortlach Phase pottery on the Saskatchewan plains (Meyer 1988). Meyer (1993:64) describes Mortlach pottery as follows:

> *Vessels generally have globular bodies, sometimes with strong, even angular shoulders. The complex profiles of these vessels are formed by constricting necks and a variety of rim shapes. The latter may simply flare out slightly, or may be vertical (straight), angled, or S-shaped. These rims (and occasionally the shoulders) are elaborately decorated with pinches, incisions, cord-wrapped tool impressions, and punctates. These decorations occur in a variety of motifs.*

Given the elaborate decoration and wide variety of surface treatments and vessel profiles, archaeologists have had difficulty establishing types and wares for Mortlach pottery, as well as clarifying or delineating regional expressions. Pottery exhibiting the above mentioned traits has been found at Saskatchewan sites such as Mortlach (EcNl 1), Lake Midden (EfNg 1), Stoney Beach (EdNh 1), and Broadway Avenue (FaNp 1) (Walker 1999). Mortlach sites are often sizeable, containing dense deposits of cultural materials. These include large amounts of pottery and intensively processed bison bone (Meyer 1993).

Mortlach pottery shares a number of attributes with that of Middle Missouri villages, and includes other elements of their material culture such as ice gliders and slot knives (Meyer 1993; Walde 1995). Mortlach components in southern Saskatchewan often include a high percentage of Knife River Flint and fused shale. Given their connection to Middle Missouri villages, Mortlach groups were able to access European trade goods as they became available. Iron projectile points, clay pipes, and trade beads are some of the European materials that have been recovered in Mortlach components (Meyer 1993). There is a paucity of absolute dates for Mortlach components; at present, most suggest a temporal span of ca. 550 rcybp through to the protohistoric period.

Mortlach sites are found throughout the grasslands and the southern parklands of Saskatchewan, bounded to the west by late variant Old Women's Phase, the south by Middle Missouri village cultures, and the north by the Selkirk composite (Walde 1995). It is possible that some bands spent winters near the grassland/parkland interface and summers on the open prairie. While interacting with boreal forest adapted Pehonan culture groups, Mortlach groups did not utilize the southern edge of the boreal forest as part of their territory (Meyer and Epp 1990). It has been hypothesized, based on the distribution of Mortlach pottery and early historic accounts of where different First Nations were situated, that the Mortlach culture could represent the historically known Hidatsa and Atsina (Malainey 1991) or the Assiniboine (Walde 1995).

Mortlach pottery and Plains Side-notched projectile points have been found in the southern edge of the boreal forest, most notably in the Nipawin region. However, a true Mortlach occupation in this area is lacking. The presence of these artifacts in this area has instead been interpreted as a result of long distance visiting and intermarriage between the plains adapted Mortlach groups and forest adapted Selkirk groups at Selkirk camp sites (Meyer and Epp 1990). The influence of Mortlach culture in the southern boreal forest can be seen by the presence of plains pottery traits such as angled shoulders and rims, S-shaped rims and fingernail/finger pinching decoration on shoulders and rims on Selkirk ware vessels. In addition, a small amount of Mortlach pottery has been recovered in association with Pehonan materials (Meyer 1981; Meyer and Epp 1990). These are noted at the Bushfield West (FhNa 10), Francois (FhNa 3), and Mollberg (FhNa 1) sites.

3.2.4 Protohistoric Period

During the Protohistoric Period (ca. 1750 - 1874), First Nations groups often incorporated European goods into their material culture, though they may not have been in direct contact with European traders. Indirect trade through middlemen in contact with Europeans would result in the presence of manufactured items in a region long before the initial establishment of trading posts (Burley et al. 1982). European trade goods such as glass beads, clay pipes, and metal trade points have been recovered in archaeological assemblages in association with lithic and ceramic recoveries (Meyer 1993; Rollans and McKeand 1992; Walde 1995). In many instances, the higher quality manufactured goods replaced indigenous technologies; for instance, copper pots and kettles took the place of clay pottery vessels. Because of the disruptions to human populations caused by the introduction of horses, guns and diseases, the exact distribution of Aboriginal groups at the beginning of the Protohistoric period remains controversial.

3.2.5 Historic Period

The first European to see Saskatchewan was the Hudson's Bay Company fur trader Henry Kelsey who entered the area in the winter of 1690/91. Following this, several fur trade journeys followed the Saskatchewan River system. For instance, Anthony Henday travelled through the Forks area in 1754/55; Joseph Smith and William Pink between 1763 and 1770; David Thompson between 1786 and 1788; and Peter Fiddler in 1792 (Russell 1999).

The first known fur trade posts in the area were built on the Saskatchewan River south of project area in the mid-1700s by French traders. These included the French post Fort St. Louis I, which operated from 1753 to 1757. This was built by Captain Louis Luc de la Corne. Subsequent to the French posts, a series of posts were constructed by the Hudson's Bay Company, the Northwest Company, and various independent traders (Meyer and Thistle 1995).

William Pink, participating on a series of four journeys between 1766 and 1770 with Cree groups along the Saskatchewan and North Saskatchewan Rivers, left canoes abandoned at FALC (Fort St. Louis I). Following this, Matthew Cocking visited the old FALC area in 1772. Fort la Jonquière, which operated in 1751, may also have been in the vicinity (Russell and Meyer 1999).

FALC I operated from 1850 to 1885 as a Hudson's Bay Company post (Russell and Meyer 1999). This was at the location of the previous French Fort St. Louis (Canadian Forts 2005). FALC II operated from 1885 to beyond 1930 as a Hudson's Bay Company post (Russell and Meyer 1999). This was situated at the previous site of French Fort des Prairies (also known as Nepawi House) (Canadian Forts 2005).

It is worthy of note that many of the trading posts along the Saskatchewan River were established at important aggregating centres, such as Opaskweyaw, Paskwatinow, Nipawiwinihk, and Pehonan (Meyer and Thistle 1995). These are sites at which members of several regional aboriginal bands assembled on an annual or semi-annual basis for intensive social interaction and religious ceremonies (Meyer and Thistle 1995). The placement of the forts can be seen as an effort by the traders to insert their economic ventures into the existing social geography of the regional Cree bands.

The FALC area was the location of the aggregating centre Pehonan, which means "the waiting place", and was part of the landscape utilized by the historically recognized Pegogamaw Cree (Meyer and Thistle 1995; Meyer and Russell 2004). Networks of trails led to resource areas and spiritual places surrounding these aggregating centres (Meyer and Russell 2004). The aggregating centres have produced artifacts representative of human occupation dating back several millennia and are, thus, of considerable antiquity (Meyer and Thistle 1995).

By the 1850s the Canadian government began discussing the construction of a railroad in to the northwest in order to facilitate colonization. In the early 1860s an expedition headed by John Palliser was sent by the Royal Geographical Society to discover routes and assess the suitability of the land for agriculture. In 1872 the government passed the *Dominion Lands Act*, which gave ownership of land to any settler who paid a 10 dollar registration fee and maintained residency for three years on an unoccupied quarter-section of land. The arrival of the Northwest Mounted Police, primarily as a result of the illegal whiskey trade, brought Saskatchewan under the jurisdiction of Dominion of Canada in the late 19th Century (Archer 1980).

4.0 ARCHAEOLOGICAL FIELDWORK METHODOLOGY

The HRIA for the proposed Star-Orion South Diamond Project was completed by Golder using standard archaeological procedures. This included systematic pedestrian reconnaissance and sub-surface test exploration. Pedestrian surface reconnaissance is the most common method used by archaeologists to identify sites within a project area (Ruppé 1966). Visual inspection of the ground is particularly effective in areas with good surface visibility, such as regions of limited soil development and sparse vegetation (Schiffer et al. 1978). Shovel probes are used by archaeologists to locate and identify subsurface archaeological deposits, and are useful in areas of poor surface visibility (Krakker et al. 1983; Nance and Ball 1986; Kintigh 1988). Shovel probes can also provide important information on the integrity, dimensions, and density of cultural materials found at archaeological sites (Kintigh 1988).

Field crews consisted of between four and eight members at any given time. Designated areas of the project footprint were assessed using pedestrian transects that were typically spaced at 25 m to 40 m intervals. Several passes were made within a project boundary until the area was assessed. Sparse vegetation cover and

exposure of the sandy surface resulted in good surface visibility in the jack pine upland areas. Visibility was limited in ravines and low lying areas.

To determine the presence of buried archaeological deposits, shovel probes were judgmentally excavated during the surface reconnaissance. The placement of shovel probes took into account knowledge of the correspondence between landform features (i.e., ravine valley crest, hilltops) and the location of previously documented sites in the project area as well as the southern boreal forest generally. As such, areas that exhibited higher heritage potential were subject to more intense and systematic shovel testing than locations with lower potential. All shovel probes measured 40 cm by 40 cm and were excavated to between 50 cm and 100 cm below surface. The backdirt and wall profile from each test or probe was carefully examined with a trowel for evidence of cultural materials.

When subsurface cultural remains were encountered, shovel probes were placed at 5 m intervals surrounding the first positive subsurface test. This spacing continued until negative shovel probes were excavated. The goal of this testing procedure was to determine the horizontal extent of a site and the density of the cultural assemblage(s) within the area. Handheld GPS units, including GARMIN® GPS 12 and GPS map 60Cx, were used to record all shovel probe locations, as well as specific cultural, topographic, and project features.

5.0 ARCHAEOLOGICAL SURVEYS

HRIAs associated with advanced kimberlite exploration haven been ongoing in the FALC Provincial Forest since 2004. This included work conducted by Golder in the Joint Venture Property and Star Kimberlite, as well as work conducted by Western Heritage Services Inc. (Western Heritage) in areas associated with the exploration of the Star Kimberlite. This culminated in HRIAs specifically for the proposed Star-Orion South Diamond Project footprint in 2008 and 2010. Prior to these assessments, no HRIAs had been carried out in the project area. However, it should be noted that previous HRIAs were conducted as early as 1994 on behalf of the Rhonda Mining Corporation's Diamond Exploration Program in areas adjacent to the current project area (Sentar Consultants Ltd. 1994 and 1995). A total of 19 Archaeological Investigation Permits have been issued between 2004 and 2010 in relation to diamond exploration in the FALC Provincial Forest (Table 3). A brief summary of HRIAs conducted under these permits is presented below.

Table 3: Archaeological Investigation Permits Issued in the Fort à la Corne Provincial Forest Study Area

Permit No.	Permit Holder	Project Components
04-102	Golder	Kimberlite bodies, geological anomaly pads, various drill pads, water pits, mud pits, access road right-of-way
05-038	Golder	General landscape survey in Joint Venture Property, kimberlite bodies, project specific disturbances (i.e., drill pads, mud pits)
05-087	Western Heritage	Post-impact assessment of various drill pads
06-064	Golder	Orion and Star West bodies, drill pads, access road right-of-way
06-103	Western Heritage	Infrastructure access roads, various drill pads
07-053	Golder	Orion South Shaft
07-245	Golder	Kimberlite Body 120, 140/141, drill pad
07-259	Golder	Drill Pad SPF-29
07-292	Golder	East Ravine survey and LDD pads
07-305	Golder	Drill Pad SPF-29
07-341	Golder	Drill Pad SPF-85

08-092	Golder	LDD pad expansions in Kimberlite Bodies 118, 122, and 150
08-093	Golder	HRIA of Orion South Pit
08-094	Golder	HRIA of Star Diamond Project
08-139	Golder	Orion - Star water line
08-145	Golder	HRIM of Star-Orion South Diamond Project
08-175	Golder	LDD expansions (Star Body)
10-208	Golder	HRIA of Star-Orion South Diamond Mine Project 2010 Facilities Footprint
10-237	Golder	HRIM of Star-Orion South Diamond Mine Project 2010 Facilities Footprint

LDD = Large Diameter Drill.

5.1 2004 Golder Permit No. 04-102

Golder began HRIA investigations in 2004 on proposed projects related to diamond exploration in the Joint Venture Property, located to the northwest of the Star Kimberlite. At this time, the Joint Venture consisted of De Beers Canada Inc., Kensington Resources Ltd., and Cameco Corporation. This work was conducted under Permit No. 04-102 (Golder 2005). During the course of this HRIA, approximately 270 ha including 12 kimberlite bodies, four geological anomaly pads, 33 drill pads, three drill pad extensions, one fuel depot, three water pits, five mud pits, and 4.7 km of access road right-of-way (ROW) were investigated. A total of 711 shovel tests and probes were excavated, and seven heritage resources were discovered as a result of these assessments: FhNe 8 to 12 and FhNf 26 to 27.

5.2 2005 Golder Permit No. 05-038

Golder continued with HRIAs in 2005 in the Joint Venture Property under Permit No. 05-038 (Golder 2006a). This included assessment of project specific disturbances such as drill pads and trails occurring in 2005, and pre-impact assessments of kimberlite bodies that would be subject to future exploration activities. In addition, a general landscape survey was conducted in areas of high heritage potential. This assessment was completed as part of the long-term planning process for the Joint Venture within the FALC project area.

A total of 37, 1 ha drill pads were investigated and approximately 6.3 km of associated access roads. In addition, seven leases of less than 1 ha were assessed including lay down areas, water wells, mud pits, lagoons, and buildings. Fifteen kimberlite bodies or extensions of previously assessed kimberlite bodies were investigated, as well as approximately 17.5 km of associated access roads. Specific impact activities (drill pad leases and access road ROW) were assessed on the west portion of the Star Kimberlite extending into the Joint Venture Property.

As part of the general landscape survey, approximately 2,000 ha considered to be of moderate to high heritage potential were assessed along 40 km of creeks and ravine features. The majority of these areas were not in conflict with proposed exploration related activity.

During surface reconnaissance and excavation of more than 3,100 shovel tests and probes, 100 heritage resources were discovered as a result of the 2005 investigations. These newly recorded sites included FhNe 13 to 28, 30 to 34, 36, 38 to 42, 44 to 46, and 48 to 85 and FhNf 28 to 56 and 59 to 61.

5.3 2005 and 2006 Western Heritage Permit Nos. 05-87 and 06-103

Western Heritage also carried out HRIAs in the Star Kimberlite area over the course of a two year period. A search of the Heritage Resources Branch database of previously recorded sites indicate that 17 sites were

recorded during assessments conducted in 2005 under Permit No. 05-087 (FhNe 47 and 86 to 99 and FhNf 57 and 58), and 24 sites were recorded during assessments conducted in 2006 under Permit No. 06-103 (FhNe 102 to 114, 116, 118 to 120, and 124 to 130). These surveys focused on drill pad assessments within the Star Kimberlite, and a post-impact assessment of various infrastructure roads. A detailed assessment or excavation was carried out on seven (FhNe 86, 88, 90, 91, 108, 109, and 112) of these sites (Western Heritage 2006). A total of 58 m^2 were excavated and over 11,000 artifacts were recovered.

5.4 2006 Golder Permit No. 06-064

Golder conducted the 2006 HRIA in the Joint Venture Property under Permit No. 06-064 (Golder 2006b). Approximately 300 ha of terrain and 5.6 km of access road ROW were investigated during the HRIA. A total of 614 shovel tests and probes were excavated. Individual drill sites and road ROW as well as large areas within the Orion Cluster and the Star West Kimberlite body were assessed through pre-construction, post-construction, and construction monitoring phases.

Six previously unrecorded heritage resources were identified (FhNe 100, 115, 117, and 121 to 123), and 10 previously recorded heritage resources were revisited (FhNe 8, 9, 11 to 14, 26, 27, 54, and 55) in relation to proposed project activities.

5.5 2007 Golder Permit Nos. 07-053, 07-245, 07-259, 07-292, 07-305, and 07-341

Beginning in 2007 Golder began conducting HRIAs on behalf of Shore Gold in their Star Kimberlite property, in addition to the Joint Venture Property, whose partners now included Kensington Resources and Newmont Mining Corporation of Canada. The HRIAs were completed under Permit Nos. 07-53, 07-245, 07-259, 07-292, 07-305, and 07-341 (Golder 2007a, 2007b, 2007c, 2007d, 2007e, and 2007f).

Included in these assessments were the Orion South bulk sample shaft, remaining portions of Kimberlite Bodies 120 and 140/141, eight geotechnical drill pads surrounding the Star Kimberlite, the expansion or re-use of 10 drill pads in heritage sensitive areas along the East Ravine, and an HRIA of the East Ravine Road. A total of 7.8 km of access road, 109 ha of kimberlite bodies, 9.1 ha of drill pads were assessed, and 495 shovel probes were excavated.

Four new heritage resources were identified (FhNe 131 to 134) and 24 previously recorded sites were revisited (FhNe 49, 53, 86 to 91, 102 to 107, 110 to 111, 114, 116, 120, and 125 to 129).

5.6 2008 Golder Permit Nos. 08-92, 08-093, 08-094, 08-139, 08-145, and 08-175

HRIAs continued to be carried out by Golder in 2008 in relation to various small scale exploration activities and infrastructure projects. These were completed under Permit Nos. 08-92, 08-139, and 08-175 (Golder 2008a, 2008b, 2008c, and 2008d). Included in these assessments were Large Diameter Drill (LDD) pad expansions in the 118, 122, and 150 Kimberlites, the Orion South Kimberlite, a water line extending between the Orion South Shaft and the Star Kimberlite shaft, and LDD pad expansions in the Star Body. Approximately 20 ha of drill pads and 3.8 km of water line were assessed. No new heritage resources were identified during these assessments; however, two previously recorded sites were revisited (FhNe 14 and 21).

In 2008, assessment of the Star-Orion South Diamond Project also began. Nine previously recorded heritage resources located in the proposed Orion South Pit were assessed and evaluated under Permit No. 08-093 (Golder 2009). This included seven Precontact sites (FhNe 10, 22, 23, 57, 58, 59, and 131) and two Historic cabins (FhNe 12 and 92) dating to the 20th Century. The remaining proposed facilities footprint including the Star Open Pit, Overburden Storage, PKCF, Plant Site, Unprocessed Kimberlite Stockpile area, CPKS, East Ravine Reservoir and 101 Pond were assessed under Permit No. 08-094 (Golder 2010a). A total of 3,084 ha were assessed and 5,797 shovel probes excavated. The objective of the assessment was to completely examine the project areas to inventory known sites in conflict, as well as revisit previously recorded sites where additional data was required to determine their interpretive potential. Twenty-five previously unrecorded sites were identified (FhNe 135 to 157 and FhNf 62 to 64) and 35 known sites were revisited.

The inventory assessment was followed by mitigation of 22 sites in the project footprint identified as having moderate or high interpretive potential under Permit No. 08-145 (Golder 2010b). As a result of the mitigation program 365.25 m^2 were excavated and 58,809 artifacts were recovered.

5.7 2010 Golder Permit Nos. 10-208 and 10-237

In 2010 changes were made to the proposed facilities footprint. The East Ravine Pond, 101 Reservoir, and Unprocessed Kimberlite Stockpile area were eliminated; the Plant Area was reduced; expansions were made to the Overburden Storage area, and CPKS area; and the Duke Ravine/Polishing Pond and Sewage Lagoon were added. As a result, an HRIA was carried out of all previously unassessed footprint areas under Permit No. 10-208 (Golder 2010c). A total of 956 ha were assessed and 1,056 shovel probes were excavated. During the course of the assessment, seven previously unrecorded heritage resources (FhNe 159, 160, 161, 162, 163, 164, and 165) were identified and one previously recorded site (FhNf 50) was revisited.

The HRIA was followed by mitigation of five previously recorded heritage resources located in the new or expanded footprint determined to have moderate to high heritage potential (FhNe 26, 27, 34, and 36, and FhNf 59). This resulted in the excavation of 43 m^2 and the recovery of 2,304 artifacts under Permit No. 10-237 (Golder 2010c).

6.0 HERITAGE RESOURCES

As a result of the HRIA programs carried out between 2004 and 2010, approximately 6,790 ha of the FALC Provincial Forest were assessed, including the excavation of 11,773 shovel probes. A total of 190 heritage resources were identified. Of these, 108 occur within the proposed Star-Orion South Diamond Project footprint. These heritage resources are discussed further below.

6.1 Star Open Pit

The proposed Star Open Pit has been subject to the greatest number of HRIAs as a result of advanced exploration of the Star Kimberlite between 2004 and 2008. A total of 55 heritage resources occur in this project footprint.

6.1.1 FhNe 11

FhNe 11 is located at the base of a prominent landform known locally as Spy Hill. Spy Hill itself is found along the eastern edge of an upland that provides a unique vantage point of the study area looking toward the East Ravine. The Saskatchewan River valley, located 3 km southeast, is also visible from this location (Figure 5).

Hummocky sand dune terrain is found to the west of the site, while the landscape southeast of the upland slopes toward a low muskeg located approximately 600 m away. Spy Hill and much of the surrounding terrain is in open grassland with sparse regenerating jack pine; however, an aspen bluff is located at the base of the hill.

The site was originally identified under Permit No. 04-102 during HRIA of a proposed drill pad and access road (Golder 2005). A dense debitage scatter was noted on a bladed trail that passed along the base of Spy Hill to Kimberlite Bodies 134 and 101. The scatter consisted of 180 debitage along with a core and fire-cracked rock (FCR). This included a cluster of approximately 150 artifacts dominated by SRC in a 1.5 m by 1 m area on a bench at the eastern base of Spy Hill. Four shovel tests produced 12 debitage comprised of SRC, Red River chert, quartzite, and unknown chert from 10 cm and 20 cm B.S.

The site was revisited under Permit No. 05-038 to conduct a shovel testing program to address continued use and upgrading of the trail. Twenty-three tests and probes were excavated along the access road in the FhNe 11 area. Four of the tests produced cultural materials, as did the screening of a road cut exposure. In total, 120 artifacts were recovered from the tests and road cut screening.

As a result of the positive shovel tests and dense artifact scatter, a recommendation was made to discontinue use of the trail. The trail was bermed off to limit vehicular access and prevent further impacts to FhNe 11.

6.1.2 FhNe 13

FhNe 13 is an artifact find site located approximately 100 m west of an unnamed tributary of the East Ravine and 2.5 km northwest of the Saskatchewan River. The site was originally identified under Permit No. 05-038. Four SRC debitage and one silicified sandstone pecking hammer were observed on the surface of a narrow jack pine ridge. Although the scatter itself was not assessed at the time, 10 shovel probes placed approximately 50 m to the northwest along the landform were negative for cultural remains.

FhNe 13 was revisited during the 2008 assessment under Permit No. 08-094 (Photo 1). A SRC flake was observed on the surface in the area of the original artifact finds. To determine the presence of an intact component, 24 shovel probes were excavated along the ridge the original site was located on and another ridge complex to the south, in an area approximately 170 m long by 25 m wide. All probes were negative for cultural materials. The site appears to have a sparse artifact density and lacks a buried component as indicated by the negative shovel probes.

6.1.3 FhNe 14

FhNe 14 is an artifact scatter site located approximately 2.5 km northwest of the Saskatchewan River on the eastern edge a low-lying muskeg. The surrounding terrain is hummocky and vegetated with aspen and willow. The site is partially disturbed by a bladed trail.

Figure 5: Location of Known Heritage Resources in Star-Orion South Diamond Project

Photo 1: View of FhNe 13

FhNe 14 was identified by Golder under Permit No. 05-038 (Golder 2006a) during an HRIA for a proposed exploratory drill pad. During the original assessment two SRC debitage were observed on a cleared trail. A total of 27 shovel probes were excavated in intact areas surrounding the artifact finds. Five probes were positive for cultural materials producing twelve lithic debitage of SRC, quartz, and chert. The surface finds and positive probes were identified in an approximately 30 m by 30 m area.

6.1.4 FhNe 17

FhNe 17 is an artifact find site of unknown precontact affiliation located 3.5 km northwest of the Saskatchewan River and 1.3 km west of the East Ravine. The site was identified under Permit No. 05-038 in hummocky upland terrain. Two SRC debitage were observed on a narrow ridge along bladed access road. Five shovel probes were excavated in the immediate site area adjacent to the trail; however, no additional artifacts or buried soils were recovered.

6.1.5 FhNe 21

FhNe 21 is an artifact find site of unknown precontact affiliation located 2.5 km north of the Saskatchewan River, and immediately adjacent to a muskeg that serves as the headwaters for the West Ravine. The site was identified under Permit No. 05-038.

Seven artifacts were identified on the surface in a disturbed drill pad within a 40 m by 10 m area. This included five SRC debitage (one primary flake, two secondary flakes, and two shatter) one quartz shatter and one chert biface. Five shovel probes were excavated in the scatter area; however, no additional artifacts were recovered. As such, it appears that FhNe 21 is a sparse lithic scatter of limited heritage significance.

6.1.6 FhNe 47

FhNe 47 is an artifact scatter site located 1.3 km northwest of the Saskatchewan River and 400 m west of the East Ravine. The site was originally recorded under Permit No. 05-087. A light scatter of lithics consisting of eight pieces of SRC debitage were observed in a 20 m by 20 m area on an old drill pad. It was apparent that the site was highly disturbed with no intact components remaining.

6.1.7 FhNe 49

FhNe 49 is located on a jack pine ridge on the east valley crest of the East Ravine and approximately 2 km northwest of the Saskatchewan River valley. FhNe 49 was first identified by Golder (2006a) as a lithic scatter along a bladed trail and turn around area under Permit No. 05-038. The site consisted of 36 observed debitage in a 200 m by 65 m area. Eleven shovel probes were excavated in intact areas along the ridge adjacent to disturbed areas. One probe produced 30 pieces of debitage 0 cm to 20 cm below surface. In 2006, FhNe 104 (a lithic scatter) was recorded in the same area by Western Heritage under Permit No. 06-104. It was later determined that FhNe 49 and FhNe 104 represent the same site.

FhNe 49 was revisited again under Permit No. 07-292. A lithic scatter of 120 items was observed over an 85 m by 40 m area along the East Ravine Road and a disturbed area west of the road. Included was one biface fragment. SRC comprised the entire assemblage with the exception of one generic chert shatter. Given the extensive scatter observed along the trail, FhNe 49 appears to have been an extensive site. The one positive probe that produced 30 debitage may indicate an activity area.

6.1.8 FhNe 50

FhNe 50 is an artifact scatter site located on the west valley crest the East Ravine, 2.5 km northwest of the Saskatchewan River. The site was discovered under Permit No. 05-038. The scatter consists of 37 SRC debitage and one SRC biface fragment observed on the surface in a 120 m by 45 m area.

A total of 14 shovel probes were excavated in the immediate vicinity of the scatter; however, all probes were negative for cultural materials. Given that no artifacts were recovered during testing of the landform, it appears that FhNe 50 is represented by a sparse cultural component with no buried deposits.

6.1.9 FhNe 53

FhNe 53 is located approximately 2.5 km north of the Saskatchewan River and 150 m east of the East Ravine. The site was originally identified by Golder under Permit No. 05-038. The site consisted of six SRC debitage in a 60 m by 20 m area in a bladed trail. Nine shovel probes were excavated in intact areas adjacent to the trail; all were negative for artifacts and buried soils.

FhNe 53 was revisited under Permit No. 07-292 during assessment of the East Ravine Road. One SRC secondary flake was observed approximately 55 m south of the original site UTM location. No additional testing was conducted. FhNe 53 is represented by a sparse scatter with no evidence of intact components.

6.1.10 FhNe 73

FhNe 73 is an artifact find site located 2.2 km northwest of the Saskatchewan River and 250 m east of the West Perimeter Ravine. The site was identified under Permit No. 05-038 along a bladed access road leading from Kimberlite Body 134 to the Star drilling area. The terrain in this region is level to gently rolling and vegetated with regenerating jack pine.

FhNe 73 consists of a single SRC secondary flake observed on the bladed trail. Four shovel probes were placed adjacent to the trail surrounding the artifact find; however, no buried soils were identified and no additional artifacts were recovered.

6.1.11 FhNe 86

FhNe 86 is located on a small point of land on the eastern valley crest of the East Ravine, approximately 2.3 km northwest of the Saskatchewan River. According to the Saskatchewan Archaeological Resource Record (SARR) form, the site was originally identified by Western Heritage during assessment of a proposed drill pad under Permit No. 05-087. Approximately 100 SRC debitage were collected from the surface and shovel probes were placed systematically across the landform. The site was subsequently destroyed during drill pad construction.

The following year, a post-impact assessment of the site was carried out under Permit No. 06-103 (Western Heritage 2006). A total of 23 m^2 were excavated within the disturbed drill pad. Over 12,000 debitage and 15 tools were recovered, including one Hanna projectile point.

The site was revisited under Permit No. 08-094. The original excavation block was readily visible. However, the landform on which the site is located was extensively disturbed by the drill pad and adjacent developments along the East Ravine Road. As no intact areas remained adjacent to the drill pad, only limited data would be gained from further excavations at FhNe 86. Further communication with the Heritage Resources Branch (Ebert, 2008, pers. comm.) indicated that the original post-impact mitigation at FhNe 86 was adequate.

6.1.12 FhNe 87

FhNe 87 is located approximately 1.8 km north of the Saskatchewan River and 450 m east of the East Ravine. The site was originally identified as an artifact find under Permit No. 05-87. One SRC Pelican Lake point was observed in blade tillings along the edge of the East Ravine Road; however, the site was not assessed.

FhNe 87 was revisited under Permit No. 07-292 during assessment of the East Ravine Road. A scatter of lithics was observed in a 140 m by 30 m area along the road and the eastern edge of existing Drill Pad SPF 77. Included were one end scraper, two primary flakes, eight secondary flakes, and one shatter, all produced from SRC.

To determine the presence of intact archaeological deposits, five shovel probes were placed at 10 m intervals along the south side of the East Ravine Road adjacent to the scatter, and one was placed immediately south of the drill pad. No buried soils or artifacts were observed in any of the probes. Based on the results of the assessment, FhNe 87 is of limited scientific value.

6.1.13 FhNe 88

FhNe 88 is located approximately 1.5 km northwest of the Saskatchewan River on a narrow point of land extending west into the valley of the East Ravine. Vegetation consists primarily of an open stand of regenerating jack pine on the landform, with thick aspen and brush on the slopes and ravine below. A portion of the site has been previously disturbed by a 5 m wide bladed trail that bisects the point of land and leads down the steep slope to the ravine below. The site is immediately adjacent to the main East Ravine Road.

FhNe 88 was first identified under Permit No. 05-087 (Western Heritage 2005) and revisited under Permit No. 06-103 while conducting HRIA as part of Star Kimberlite exploration activities (Western Heritage 2006). The

equivalent of 9 m^2 was excavated, including 23 shovel tests and two test excavation blocks. This included a 2 m by 2 m block north of the trail, where a Besant point was recovered with over 100 debitage. The second 1 m by 2 m block was opened up approximately 48 m to the southwest, along the southern crest of the ravine, where FCR was exposed on the surface. A Pelican Lake point was recovered from this block in addition to FCR and debitage. In total, 2,200 artifacts were recovered. This included 646 debitage and cores, 1,559 FCR, two unidentifiable bone fragments, and the two diagnostic projectile points mentioned above. FhNe 88 appears to represent a large site with dense artifact concentrations, and potential activity/hearth area as represented by the FCR. The scientific value of this site is considered high.

6.1.14 FhNe 89

FhNe 89 is located approximately 1.6 km northwest of the Saskatchewan River and 150 m east of the East Ravine. The site is situated on gently undulating, sandy terrain near the crest of the valley. The site was originally identified under Permit No. 05-87, and is a lithic scatter consisting of 42 pieces of SRC that were observed along the bladed trail of the East Ravine Road. The site was revisited under Permit No. 06-103 where an additional 18 pieces of debitage were observed but not collected. No shovel testing was conducted during these visits.

FhNe 89 was revisited again under Permit No. 07-292 as part of the assessment for the Star 35 Drill Pad. To mitigate impacts to this site from the drill pad, a formal artifact collection and shovel testing program was carried out. A lithic scatter totalling 58 pieces of debitage and one biface fragment was collected within a 30 m by 15 m area.

Seven shovel probes were subsequently excavated in undisturbed areas along the eastern and southern boundary of the proposed Star 35 Drill Pad to determine if there were any intact components. No palaeosols or artifacts were noted in any of these probes.

6.1.15 FhNe 90

FhNe 90 is located in open level terrain along the eastern crest of the East Ravine. Vegetation consists of surrounding stands of mature jack pine with thick aspen and brush on the slopes of the ravine. The Saskatchewan River is located 1 km south of the site. The majority of the site had been previously disturbed by drill pad construction.

FhNe 90 is an artifact find that was identified under Permit No. 05-087 during an HRIA for Shore Gold's drilling program (Western Heritage 2005). A subsequent testing program of the site was carried out under Permit No. 06-103 after construction of the drill pad revealed a significant artifact scatter (Western Heritage 2006). A total of 14 shovel probes were excavated in three areas of artifact concentrations. The equivalent of 3.25 m^2 were excavated and 526 artifacts recovered primarily from a disturbed context. This included debitage (n=521), two bifaces, a scraper, hammer stone, and one re-worked Hanna projectile point collected from the surface (Western Heritage 2006).

6.1.16 FhNe 91

FhNe 91 is an artifact scatter site located 1 km northwest of the Saskatchewan River along the east valley crest of the East Ravine. The site was originally identified as an artifact scatter under Permit No. 05-087. Excavation was subsequently carried out by Western Heritage (2006) under Permit No. 06-103. A total of 13m^2 were excavated in two areas, and 932 artifacts were recovered. This consisted of 910 debitage dominated by SRC,

three cores, 10 pieces of FCR and two broken hammer stone fragments. A potential hearth was also noted, represented by small circular soil staining and charcoal. Seven small fragments of calcined bone were also recovered. FhNe 91 has potential activity/hearth area as represented by the debitage concentration, FCR and soil staining. The scientific value of this site is considered high.

6.1.17 FhNe 93

FhNe 93 is an artifact scatter site located on the eastern valley crest of an unnamed tributary of the East Ravine, approximately 2.2 km northwest of the Saskatchewan River. The site was originally identified under Permit No. 05-087 when a triangular SRC biface was collected from the surface. No shovel probes were excavated at this time.

The site was revisited under Permit No. 08-094 (Photo 2). Approximately 17 SRC debitage and four core fragments were observed in an area approximately 115 m long by 100 m wide within the disturbed Drill Pad LDD 49. To determine the presence of intact deposits, shovel probes were placed in intact areas around the drill pad and along the valley crest. None of the 40 probes excavated in an approximately 3 ha area produced any cultural materials.

Photo 2: View of FhNe 93

6.1.18 FhNe 94

FhNe 94 is an artifact scatter site located 1.3 km northwest of the Saskatchewan River and 300 m west of the East Ravine. The site was originally identified under Permit No. 05-087. Twenty-one debitage, consisting primarily of SRC, were observed on a previously disturbed drill pad in an approximately 50 m by 75 m area. The site was highly disturbed with no intact components remaining.

6.1.19 FhNe 95

FhNe 95 is an artifact scatter site located on the east valley crest of the West Ravine, approximately 1.4 km northwest of the Saskatchewan River. The site was originally identified under Permit No. 05-087. One SRC biface, six flakes, and seven shatter were collected from the surface of a disturbed drill pad. No shovel probes were excavated.

The site was revisited under Permit No. 08-094 (Photo 3). Approximately 50 SRC and quartz debitage were observed on the surface of a disturbed drill pad in a 200 m by 75 m area. One retouched SRC flake (broken) was collected. This tool is unusual in that it is a large concave-convex flake with marginally retouched edges that has been notched at the proximal end as if to be hafted (Photo 4). Metric attributes are presented in Table 9.

To determine the presence of intact components, 22 shovel probes were excavated in undisturbed areas surrounding the scatter. Two shovel probes immediately south of the drill pad produced a total of three SRC debitage from 0 cm to 10 cm below surface; however, all remaining probes were sterile.

Photo 3: View of FhNe 95

Photo 4: Hafted Retouched Flake from FhNe 95

Table 4: Metric Attributes for FhNe 95 Hafted Retouched Flake

Cat. No.	Weight (g)	Max. Length (mm)	Shoulder Width (mm)	Base Width (mm)	Notch Width Left (mm)	Notch Width Right (mm)	Notch Depth Left (mm)	Notch Depth Right (mm)	Max. Thickness (mm)
6	7.8	40.61	33.44	25.21	7.91	9.91	2.36	2.72	6.33

6.1.20 FhNe 96

FhNe 96 is an artifact scatter site located 1.2 km northwest of the Saskatchewan River and 300 m west of the East Ravine. The site was originally identified under Permit No. 05-087. Six debitage consisting of SRC, quartzite and chalcedony, were observed on a previously disturbed drill pad in an approximately 20 m by 20 m area. The site was highly disturbed with no intact components remaining.

6.1.21 FhNe 97

FhNe 97 is an artifact scatter site located 1.5 km northwest of the Saskatchewan River and 200 m west of the East Ravine. The site was originally identified under Permit No. 05-087. Eleven debitage consisting of SRC, chalcedony, and possible basalt were observed on a previously disturbed drill pad in an approximately 20 m by 20 m area. The site was highly disturbed with no intact components remaining.

6.1.22 FhNe 98

FhNe 98 is an artifact scatter located on the west valley crest of the West Ravine, approximately 1.5 km north of the Saskatchewan River. The site was originally identified under Permit No. 05-87. Nine SRC debitage were observed on the surface of Drill Pad SPF 002 in a 20 m by 20 m area. No shovel probes were excavated.

The site was revisited under Permit No. 08-094 (Photo 5). The drill pad had been reclaimed, but surface visibility was excellent. A lithic scatter consisting of 27 SRC debitage was observed in an 80 m by 50 m area within the disturbed pad. Also noted was an Early Side-notched projectile point, which was collected from the access road

leading south of the drill pad (Photo 6). This point, manufactured out of SRC, is relatively thick, appears to be reworked, and has a ground base. Metric attributes can be found in Table 5.

Photo 5: View of FhNe 98

Photo 6: Early Side-notched Projectile Point from FhNe 98

Table 5: Metric Attributes for FhNe 98 Early Side-notched Point

Cat. No.	Weight (g)	Max. Length (mm)	Shoulder Width (mm)	Base Width (mm)	Notch Width Left (mm)	Notch Width Right (mm)	Notch Depth Left (mm)	Notch Depth Right (mm)	Max. Thickness (mm)
1718	3.5	27.1	20.1	16.25	8.4	8.27	1.62	1.72	6.48

A total of 32 shovel probes were placed in intact areas surrounding the drill pad in a one ha area. Two probes immediately south of the drill pad produced a total of five SRC debitage 20 cm to 30 cm below surface. Approximately 35 m north of this, two positive shovel probes were excavated off the northeast corner of the drill pad, along the valley crest of the West Ravine. One probe produced 57 SRC debitage representing the early and middle stages of lithic reduction, and the other probe located 10 m to the east produced one piece of shatter.

Intact components of FhNe 98 appear to exist adjacent to the previously disturbed drill pad, especially off the northeast corner.

6.1.23 FhNe 99

FhNe 99 is an artifact find site located on the east valley crest of the West Ravine, approximately 1.5 km north of the Saskatchewan River. The site was originally identified under Permit No. 05-087. Three quartzite shatter were collected from the surface; however, no shovel probes were excavated.

FhNe 99 was revisited under Permit No. 08-094 (Photo 7). A SRC flake was observed on an old, re-claimed trail on the edge of the ravine valley. To determine the presence of intact components, shovel probes were excavated in a narrow undisturbed area between the old trail and existing drill pads. One shovel probe produced a quartz flake from 10 cm to 20 cm below surface. Four subsequent probes were excavated at 5 m intervals from the positive probe in the four cardinal directions, and seven additional probes were excavated along the valley edge. All were negative for cultural materials.

6.1.24 FhNe 102

FhNe 102 is located on a narrow point of land on the east valley crest of the East Ravine, approximately 1.1 km northwest of the Saskatchewan River. The site was originally identified under Permit No. 06-103 as an artifact scatter located on the north end of Drill Pad 076. The site was revisited under Permit No. 07-292 where 13 SRC artifacts were noted in an 85 m by 30 m area consisting of debitage as well as a biface and point midsection. Five shovel probes were placed in intact areas adjacent to the scatter. Two were positive, producing eight pieces of debitage.

FhNe 102 was revisited under Permit No. 08-094 to conduct additional testing (Photo 8). In addition to debitage observed on the surface of the reclaimed drill pad, a broken SRC biface fragment was collected from the trail leading into the pad (Photo 9). Metric attributes are presented in Table 6.

Photo 7: View of FhNe 99

Photo 8: View of FhNe 102

Photo 9: Biface Fragment from FhNe 102

Table 6: Metric Attributes for FhNe 102 Biface

Cat. No.	Weight (g)	Max. Length (mm)	Max. Width (mm)	Max. Thickness (mm)
1384	11.1	N/A	28.47	12.16

A total of 35 shovel probes were placed in intact areas surrounding the drill pad in a 1 ha area. One positive shovel probe produced a single SRC secondary flake at the south end of the landform. However, subsequent probes surrounding this probe were sterile. Approximately 100 m north of this area, and adjacent to the original scatter, two positive shovel probes located west of the drill pad produced a total of three SRC debitage 0 cm to 20 cm below surface. Despite the almost complete disturbance of the narrow point of land where the site was located, there appears to be intact components still present.

6.1.25 FhNe 103

FhNe 103 is an artifact find originally identified under Permit No. 06-103. A single SRC flake was observed on an access road to a drill pad located approximately 85 m west of the East Ravine Road. The site is located approximately 1.4 km north of the Saskatchewan River and 100 m east of the East Ravine.

Despite an attempt to revisit the site under Permit No. 07-292, FhNe 103 could not be successfully relocated. No cultural materials were observed on the existing access road. To determine the presence of intact archaeological deposits, five shovel probes were placed at the site location. No buried soils or artifacts were observed in any of the probes. FhNe 103 appears to represent a single find with no associated buried components.

6.1.26 FhNe 105

FhNe 105 is an artifact find site located on the east valley crest of the East Ravine, approximately 3 km north of the Saskatchewan River. The site was first recorded under Permit No. 06-103 and revisited under Permit No. 07-292. Two SRC debitage were noted on the East Ravine Road; however, only limited testing was conducted at the site.

FhNe 105 was revisited under Permit No. 08-094 to carry out further testing (Photo 10). A surface survey was conducted along the road and adjacent exposures. No artifacts were observed. A total of 18 shovel probes were then excavated in intact areas adjacent to the road in a 60 m by 60 m area. Two rows of five probes were placed on the east side of the road in approximately 10 m intervals, and eight were placed on the east side of the road. All probes were negative for cultural materials.

Photo 10: View of FhNe 105

6.1.27 FhNe 110

FhNe 110 is an artifact find site located 300 m east of the valley crest of the East Ravine, and 1 km northwest of the Saskatchewan River. The site was first recorded under Permit No. 06-103 where one SRC flake was observed on Drill Pad SPF 069. No shovel probes were excavated at this time.

FhNe 110 was revisited under Permit No. 08-094 to test for intact components (Photo 11). The drill pad was reclaimed; however, surface visibility was excellent. No additional artifacts were observed on the surface. A total of 56 shovel probes were excavated in intact areas adjacent to the drill pad in a 1 ha area. All probes were negative for cultural materials.

Photo 11: View of FhNe 110

6.1.28 FhNe 111

FhNe 111 is an artifact scatter located on a point of land between the East Ravine and an unnamed tributary, approximately 1.2 km northwest of the Saskatchewan River. The site was originally recorded under Permit No. 06-103. A concentration of SRC flakes and one potential Hanna projectile point were identified on the access road to Drill Pads SND 39 and SPF 73. The site was revisited under Permit No. 07-292 where an artifact mapping and shovel testing program was carried out in advance of drill pad expansion. A lithic scatter totalling 17 pieces of debitage were collected within a 90 m by 35 m area in Drill Pad SND 39. Thirty-four shovel probes were subsequently excavated to determine the presence of intact components. These were placed in undisturbed areas along the west and south boundary of the drill pad and in the undisturbed area along the coulee edge. All probes were negative.

FhNe 111 was again revisited under Permit No. 08-094 to carry out additional testing of the landform where the site was located. A total of 42 shovel probes were placed in a 2 ha area surrounding the drill pads and along the crest of the ravine; however, all probes were negative for cultural materials.

6.1.29 FhNe 112

FhNe 112 is an artifact scatter site located approximately 50 m east of the valley crest of the East Ravine and 2.7 km north of the Saskatchewan River. The site was first recorded under Permit No. 06-103, where a large lithic scatter was noted in an area 80 m by 30 m on the west half of Drill Pad 079. Two positive shovel probes and two excavation units were excavated in the disturbed drill pad. A total of 76 debitage were recovered.

FhNe 112 was revisited under Permit No. 08-094 to conduct further shovel testing (Photo 12). The drill pad had been reclaimed but surface visibility was excellent. No additional artifacts were observed on the surface. Intact areas adjacent to the drill pad were tested. A total of 32 shovel probes were excavated in a 2 ha area. All probes were negative for cultural materials.

Photo 12: View of FhNe 112

6.1.30 FhNe 113

FhNe 113 is an artifact scatter site located in the inter-ravine area. The site is situated approximately 1.3 km northwest of the Saskatchewan River on a narrow ridge of land near the confluence of the East Ravine and an unnamed tributary. FhNe 113 was first discovered under Permit No. 06-103. Two SRC flakes were observed and one SRC point midsection was collected from an access road to Drill Pad SPF 62. Two shovel probes were excavated adjacent to the point midsection in the road. Both were negative.

The site was revisited under Permit No. 08-094 (Photo 13). Three SRC debitage and one quartz debitage were observed on the drill pad in an area approximately 40 m by 30 m. To determine the presence of intact deposits, 28 shovel probes were excavated in undisturbed areas surrounding the drill pad and along the narrow landform between the ravines. None contained cultural materials.

Photo 13: View of FhNe 113

6.1.31 FhNe 114

FhNe 114 is located on the east valley crest of the East Ravine, approximately 1.3 km northwest of the Saskatchewan River. The site was originally identified under Permit No. 06-103 as a surface scatter observed along the East Ravine Road. The site was revisited under Permit No. 07-292 as part of an HRIA for drill pad expansions. Over 100 debitage and one FCR were noted and mapped along the road and Drill Pads SPF 78 and SPF 120, and the basal portions of two Early Side-notched points were collected. A total of 24 shovel probes were excavated; however, all were negative for cultural materials.

FhNe 114 was revisited under Permit No. 08-094. Surface visibility was excellent and artifacts from the mapped scatter were relocated. A total of 38 shovel probes were excavated in intact areas surrounding the drill pad in a 1 ha area. One positive probe produced a SRC flake, the rest were negative for cultural materials. The site appears to have been completely disturbed by previous road construction.

6.1.32 FhNe 115

FhNe 115 is located on a knoll and side slope of a ridge feature located approximately 600 m west of the East Ravine and 2.5 km northwest of the Saskatchewan River. The site is near the north end of a tributary flowing southeast into the ravine. The hummocky terrain is characterized by a regenerating jack pine forest. Shore Road is located immediately south of the site while a drill pad disturbance occurs to the east.

FhNe 115 was first identified by Golder (2006b) under Permit No. 06-064 during HRIA assessments for DeBeers. A McKean lanceolate projectile point was collected from the surface on top of the knoll, while a small but dense debitage concentration was observed along the side slope near the base of the ridge. Included in this

concentration were approximately 90 debitage in a 1.5 m area. Debitage was also observed on the adjacent disturbed drill pad. Subsequent testing of the ridge feature and areas adjacent to the drill pad were negative for cultural materials; however, the immediate area around the debitage concentration was not tested.

6.1.33 FhNe 116

FhNe 116 is an artifact scatter site located 250 m east of the East Ravine valley crest and 900 m northwest of the Saskatchewan River. The site was originally identified under Permit No. 06-103 when an artifact scatter was observed on the surface of Drill Pad SPF 071. The site was revisited under Permit No. 07-292 where 12 SRC debitage were noted along the access road at the north entrance to the drill pad. Six shovel probes were excavated in intact areas adjacent to the road, one of which produced a single SRC shatter 0 cm to 20 cm below surface.

FhNe 116 was revisited under Permit No. 08-094 to carry out additional testing (Photo 14). The drill pad was reclaimed; however, surface visibility was excellent. The artifact scatter was relocated along the access road. A total of 44 shovel probes were excavated in intact areas adjacent to the drill pad and access road in a two ha area. Probes surrounding the original positive shovel test were sterile; however, an additional shovel probe located 25 m to the southwest was positive, producing two SRC shatter 0 cm to 20 cm below surface. Subsequent shovel probes surrounding this positive test were all negative for cultural materials.

Photo 14: View of FhNe 116

6.1.34 FhNe 117

FhNe 117 is an artifact find site of unknown precontact affiliation recorded under Permit No. 06-064. The site is located 2 km northwest of the Saskatchewan River along the southern edge of a muskeg, in level terrain that is thickly vegetated with young aspen, alders, and occasional stands of jack pine.

A single, light grey SRC secondary flake was recovered from the top 20 cm of a shovel probe. Four shovel probes were excavated in each cardinal direction surrounding the positive probe; however, no buried soils or additional artifacts were encountered. FhNe 117 appears to have limited areal extent and artifact density. As such, the site is considered to offer limited opportunity for further interpretation.

6.1.35 FhNe 118

FhNe 118 is an artifact find located approximately 300 m east of the East Ravine valley crest and 1.9 km northwest of the Saskatchewan River. The site was originally recorded under Permit No. 06-103. A calcined bone fragment and SRC flake were observed on the surface of Drill Pad SPF 080, and one midsection of a projectile point was collected. No subsurface testing was conducted.

The site was revisited under Permit No. 08-094 to test for intact components (Photo 15). The topography is gently undulating with intact vegetation consisting of regenerating jack pine. The drill pad had been reclaimed, but exposure was excellent. Two SRC debitage were noted on the surface of the drill pad. Fifty-five shovel probes were excavated in intact areas surrounding the drill pad and access road in an area approximately 4 ha in size. All shovel probes were negative for cultural materials.

Photo 15: View of FhNe 118

6.1.36 FhNe 119

FhNe 119 is an artifact scatter site located 250 m west of the East Ravine valley crest and 1 km northwest of the Saskatchewan River. The site was originally identified under Permit No. 06-103. A large lithic scatter was observed on an existing drill pad; however, no shovel probes were excavated.

FhNe 119 was revisited under Permit No. 08-094 (Photo 16). A lithic scatter of approximately 30 debitage was observed on the surface of Drill Pad SPF 021 in a 120 m by 50 m area. One SRC retouched flake, one SRC end scraper, and one large ovoid biface made from siliceous siltstone were collected from the surface (Photos 17 and 18; Table 7).

To determine the presence of intact components, shovel probes were excavated in undisturbed areas surrounding the drill pad. A total of 32 probes were excavated in a 200 m by 50 m area. Of these one shovel probe produced seven SRC debitage from 10 cm to 20 cm below surface, the rest were sterile.

Photo 16: View of FhNe 119

Photo 17: Retouched Flake (left) and End Scraper (right) from FhNe 119

Photo 18: Ovoid Biface from FhNe 119

Table 7: Metric Attributes of Tools from FhNe 119

Cat No.	Tool Type	Weight (g)	Max. Length (mm)	Max. Width (mm)	Max. Thickness (mm)
1	End scraper	6.2	30.12	29.85	5.7
2	Retouched flake	3.2	28.85	15.75	6.85
3	Biface	124.4	97.27	70.62	17.83

6.1.37 FhNe 120

FhNe 120 is an artifact scatter site located on the east valley crest of the East Ravine, approximately 700 m northwest of the Saskatchewan River. The site was originally identified under Permit No. 06-103 where a SRC debitage scatter was observed on Drill Pad SPF 66. The site was revisited under Permit No. 07-292. A scatter of 19 SRC debitage and one quartz core fragment were noted toward the north end of the pad and access road leading into the pad. Ten shovel probes were excavated in intact areas adjacent to the scatter. All were sterile.

FhNe 120 was revisited under Permit No. 08-094 (Photo 19). Debitage from the surface scatter were still evident on the reclaimed pad. A total of 89 probes were excavated in intact areas surrounding the drill pad and along the valley crest of the ravine in a 3 ha area. Four positive shovel probes were excavated along the valley crest at the south end of the drill pad within a 25 m by 15 m area. Three of the probes each produced one SRC debitage 0 cm to 15 cm below surface, and the fourth produced one quartzite core and one FCR 0 cm to 20 cm below surface. The potential for an intact feature is represented by the fragment of FCR recovered from the shovel probe.

Photo 19: View of FhNe 120

6.1.38 FhNe 124

FhNe 124 is an artifact scatter located approximately 200 m west of the East Ravine and 500 m northwest of the Saskatchewan River. The site was originally identified under Permit No. 06-103. A lithic scatter was observed toward the southwest corner of a drill pad. Two subsequent shovel probes in intact areas adjacent to the scatter produced 60 SRC debitage.

The site was revisited under Permit No. 08-094 (Photo 20). A lithic scatter of 10 SRC was noted towards the southwest corner of the drill pad in a 90 m by 30 m area. Sixteen shovel probes were excavated in intact areas adjacent to the drill pad and scatter in a stand of mature jack pine. All probes were negative for cultural materials.

Photo 20: View of FhNe 124

6.1.39 FhNe 132

FhNe 132 is an artifact scatter located approximately 2.2 km northwest of the Saskatchewan River and immediately west of a tributary of the East Ravine. The site was identified under Permit No. 07-305 as part of an HRIA for a proposed drill pad expansion. Sixteen flakes were observed on the surface of an old drill pad in a 25 m by 25 m area near the edge of the East Ravine. Small jack pine and sparse surface vegetation cover the landform and surface visibility was excellent.

To determine the presence of intact cultural components, seven shovel tests were excavated within the artifact scatter area. The tests measured 50 cm by 50 cm and were excavated to a depth of approximately 80 cm. Sediments were passed through a 6 mm mesh screen. No cultural materials or buried soils were identified.

Five additional shovel probes were excavated within the proposed pad outside of the artifact scatter. They were also negative for cultural materials.

6.1.40 FhNe 135

FhNe 135 is an artifact scatter located on the west valley crest of the West Ravine, approximately 1.3 km north of the Saskatchewan River (Photo 21). The site was identified under Permit No. 08-094. The site is located approximately 100 m southeast of a reclaimed drill pad on a narrow ridge with a slight northwest-southeast orientation. Vegetation on the ridge consists of an open grassy area with burnt deadfall and regenerating jack pine and aspen. The surrounding upland consists of a mix of aspen and jack pine, while the low area below the ridge within the West Ravine is comprised of dense aspen and an understory of brush.

Photo 21: View of FhNe 135

Thirteen shovel probes were placed in a 60 m by 15 m area along the ridge. Seven shovel probes spaced at 5 m intervals along the length of the ridge were positive for cultural materials. Fifty-four pieces of debitage representing all stages of lithic reduction were recovered from these probes varying from 0 cm to 40 cm below surface.

6.1.41 FhNe 136

FhNe 136 is an artifact scatter site located approximately 300 m west of the West Ravine and 1.5 km north of the Saskatchewan River (Photo 22). The site was identified under Permit No. 08-094 and consists of a SRC flake that was observed on Drill Pad STR 05-013C. After a pedestrian reconnaissance of the reclaimed drill pad, shovel probes were placed in intact areas around the periphery of the drill pad. Two shovel probes placed just south of the northeast corner produced a total of seven SRC debitage from 0 cm to 10 cm below surface. An

additional four shovel probes were placed in the four cardinal directions surrounding these probes in 5 m intervals. All were sterile for artifacts.

Photo 22: View of FhNe 136

6.1.42 FhNe 137

FhNe 137 is an artifact find site identified under Permit No. 08-094. The site is located on the east valley crest of the East Ravine, approximately 1.8 km northwest of the Saskatchewan River (Photo 23). While assessing a narrow ridge extending into the valley of the East Ravine, two shovel probes spaced 5 m apart each produced one SRC debitage 10 cm to 20 cm below surface. An additional six shovel probes were excavated at 5 m intervals in the four cardinal directions surrounding these positive probes. All were negative for cultural materials. No artifacts were observed on a disturbed drill pad and access road located immediately to the east.

6.1.43 FhNe 141

FhNe 141 is an artifact find site located approximately 1.1 km west of the East Ravine and 200 m northwest of the muskeg that feeds both the West Ravine and the West Perimeter Ravine (Photo 24). The site is located on the edge of a jack pine upland that slopes southward toward a lower aspen area that eventually leads to the muskeg. Two pieces of SRC debitage were noted in a 5 m area along a bladed access trail between Shore Road and 101 Road. This trail provides access to a number of drill pads immediately adjacent to the trail.

To determine if intact components were present, a total of 8 shovel probes were excavated. Five were placed north of the trail and three on the south side. All probes were negative for cultural materials. The site was located in a slight hollow and it appears the trail was built up with sand that was hauled in from elsewhere.

Photo 23: View of FhNe 137

Photo 24: View of FhNe 141

6.1.44 FhNe 142

FhNe 142 is an artifact find site located approximately 200 m east of FhNe 141 on the same access trail between Shore Road and 101 Road (Photo 25). The site is located on the edge of a jack pine upland that slopes southward toward a lower aspen area that eventually leads to the muskeg. One SRC debitage was noted along the trail, south of an old drill pad.

Photo 25: View of FhNe 142

To determine if buried components were present, a narrow piece of intact land between the access road and drill pad was tested. Four shovel probes placed at 5 m intervals were excavated adjacent to the find along the north side of the trail. All probes were negative for cultural materials.

6.1.45 FhNe 144

FhNe 144 is an artifact find site located approximately 50 m west of the valley crest of the West Ravine and 1.5 km north of the Saskatchewan River (Photo 26). Three SRC debitage were noted toward the southwest corner of Drill Pad SPF 001 in a 40 m by 10 m area. Two positive shovel probes placed in the treed area adjacent to the drill pad produced one SRC shatter each from 0 cm to 20 cm below surface. Shovel probes placed in the four cardinal directions surrounding these probes were negative for cultural materials. After testing, the site it became apparent that the positive shovel probes were placed in a grown over trail and the artifacts came from a disturbed context. A series of 11 shovel probes spaced at 10 m intervals were then placed along the valley crest to the west of the drill pad and positive probes. All were sterile along this intact landform.

Photo 26: View of FhNe 144

6.1.46 FhNe 145

FhNe 145 is an artifact find site located approximately 300 m west of the West Ravine and 1.8 km north of the Saskatchewan River. An Avonlea projectile point was collected from the main access road to a series of drill pads (Photos 27 and 28; Table 8). The terrain was generally flat and featureless. No additional artifacts were observed on the surface. Five shovel probes were placed adjacent to the disturbed road within the intact regenerating jack pine. Two were placed on the west side of the access road and three on the east side in approximately 10 m intervals. All probes were sterile for cultural materials.

Photo 27: Avonlea Projectile Point from FhNe 145

Photo 28: View of FhNe 145

Table 8: Metric Attributes for FhNe 145 Avonlea Point

Cat. No.	Weight (g)	Max. Length (mm)	Shoulder Width (mm)	Base Width (mm)	Notch Width Left (mm)	Notch Width Right (mm)	Notch Depth Left (mm)	Notch Depth Right (mm)	Max. Thickness (mm)
1	1.4	21.98	14.52	11.44	3.67	3.35	3.45	1.38	1.84

6.1.47 FhNe 146

FhNe 146 is an artifact find site located on the west valley crest of the East Ravine, approximately 2.6 km northwest of the Saskatchewan River (Photo 29). During assessment of the East Ravine, a crude SRC biface was recovered from a shovel probe 10 cm to 20 cm below surface (Photo 30; Table 9). Subsequent probes were placed in 5 m intervals in the four cardinal directions around this positive test. One SRC flake was found in the shovel probe 5 m to the south. The remaining shovel probes were negative. A total of six shovel probes were excavated and two artifacts collected.

6.1.48 FhNe 147

FhNe 147 is an artifact find site located on the eastern valley crest of the West Ravine, approximately 1.1 km north of the Saskatchewan River (Photo 31). A single SRC shatter was collected from a positive shovel probe 10 cm to 20 cm below surface in an intact area of regenerating jack pine. Three additional shovel probes were placed at 5 m intervals to the north, east, and west. All were negative for cultural materials.

Photo 29: View of FhNe 146

Photo 30: Biface from FhNe 146

Table 9: Metric Attributes for FhNe 146 Biface

Cat. No.	Weight (g)	Max. Length (mm)	Max. Width (mm)	Max. Thickness (mm)
2	23.5	54.22	42.57	10.24

Photo 31: View of FhNe 147

6.1.49 FhNe 148

FhNe 148 is an artifact find site located approximately 500 m west of the East Ravine valley crest and 1.2 km northwest of the Saskatchewan River (Photo 32). Two SRC flakes were observed on the surface of Drill Pad SPF 091. To determine the presence of intact components 10 shovel probes were excavated in undisturbed areas immediately adjacent to the drill pad. All were negative for cultural materials.

6.1.50 FhNe 149

FhNe 149 is an artifact scatter site located approximately 300 m west of the East Ravine valley crest and 1.3 km northwest of the Saskatchewan River (Photo 33). Numerous SRC debitage were noted in a 30 m by 20 m area toward the east side of Drill Pad SPF 137. A SRC core fragment was also observed on the trail leading into the west side of the drill pad. To determine the presence of intact components, 16 shovel probes were excavated in undisturbed areas of regenerating jack pine surrounding the drill pad. All were negative for cultural materials.

Photo 32: View of FhNe 148

Photo 33: View of FhNe 149

6.1.51 FhNe 150

FhNe 150 is an artifact find located on the east valley crest of the East Ravine, approximately 1.3 km northwest of the Saskatchewan River (Photo 34). While assessing the East Ravine, a shovel probe produced one SRC shatter 10 cm to 20 cm below surface. Four additional shovel probes were placed in the four cardinal directions surrounding this positive probe; however, all were sterile for cultural materials. An additional SRC flake was observed on a reclaimed trail to the north.

Photo 34: View of FhNe 150

6.1.52 FhNe 151

FhNe 151 is an artifact find site located on a lower terrace within the East Ravine, on the east side of the creek, approximately 2.5 km northwest of the Saskatchewan River (Photo 35). While assessing the valley, two SRC debitage were recovered from a shovel probe 10 cm to 20 cm below surface. Four additional probes were excavated in 5 m intervals from the positive probe. The terrace was very narrow only allowing two probes to be excavated to the north and two to the south. All were negative for cultural materials.

6.1.53 FhNe 153

FhNe 153 is an artifact find site located on the eastern valley crest of the West Ravine, approximately 1.7 km northwest of the Saskatchewan River (Photo 36). One SRC flake was observed on the surface of an old trail leading north from Drill Pad LDD 39. To determine the presence of intact components, shovel probes were excavated in a narrow undisturbed area between the valley crest and drill pads. One probe produced two quartz debitage from 10 cm to 20 cm below surface. Subsequent shovel probes placed at 5 m intervals in the four cardinal directions surrounding this probe were all negative. An additional nine probes were placed along the edge of the valley in a 70 m by 30 m area.

Photo 35: View of FhNe 151

Photo 36: View of FhNe 153

6.1.54 FhNe 154

FhNe 154 is an artifact find site located on the west valley crest of an unnamed tributary of the East Ravine, approximately 2 km northwest of the Saskatchewan River (Photo 37). Two SRC debitage and one core fragment were observed in an area 60 m long by 40 m wide on the surface of reclaimed Drill Pad LDD 051. The area surrounding the surface scatter was heavily disturbed by additional access roads and drill pads. To determine the presence of intact deposits, 12 shovel probes were excavated in the limited intact areas adjacent to the drill pad in an area approximately 0.5 ha in size. All probes were negative for cultural materials.

Photo 37: View of FhNe 154

6.1.55 FhNe 155

FhNe 155 is an artifact scatter site located approximately 1.3 km west of the East Ravine and 400 m northwest of the muskeg that feeds both the West Ravine and the West Perimeter Ravine. The site is located on the edge of a jack pine upland that slopes southward toward a lower aspen area that eventually leads to the muskeg. The site was observed along a bladed access trail between Shore Road and 101 Road (Photo 38). Approximately 50 debitage consisting of SRC and quartz, six fragments of granite that may represent FCR and one end scraper were noted in a 150 m by 10 m area along the trail (Photo 39; Table 10). Drill Pad 134-05 is located immediately to the north of the scatter; however, a surface reconnaissance of this exposure did not reveal additional artifacts.

To determine if intact components of the site were present, a total of 22 shovel probes were excavated. This included two rows of five probes on each side of the trail placed at 20 m intervals along the scatter. One shovel probe on the north side of the trail produced a SRC flake approximately 25 cm below surface. Two additional shovel probes placed at 5 m intervals on either side of this were negative for cultural materials.

Photo 38: View of FhNe 155

Photo 39: End Scraper from FhNe 155

Table 10: Metric Attributes for FhNe 155 End Scraper

Cat. No.	Weight (g)	Max. Length (mm)	Max. Width (mm)	Max. Thickness (mm)
4	6.37	28.2	21.88	7.99

Although shovel testing did not intercept a significant intact component, FhNe 155 is represented by an extensive artifact scatter including a tool, as well as the potential for a nearby feature as represented by FCR.

6.2 Orion South Pit

The Orion South Pit area was previously assessed over the course of multiple HRIAs conducted between 2004 and 2007 (Golder 2005, 2006a, 2006b, 2007a, and 2007c). As a result of these assessments, nine heritage resources were identified. Several of these sites were revisited under Permit No. 08-093 (Golder 2008b) and are discussed below.

6.2.1 FhNe 10

FhNe 10 was an artifact scatter site of unknown precontact affiliation recorded under Permit No. 04-102 (Golder 2005). The site was identified during assessment of a proposed mud pit associated with LDD operations. FhNe 10 was situated near the base of a small ridge, approximately 450 m southwest of an unnamed tributary of the East Ravine. Cultural materials included one SRC core fragment, six SRC debitage, and four white chalcedony debitage in a 40 m by 25 m area. The scatter was located in an area previously disturbed by timber harvest and drill pad preparation activities (Photo 40). Eleven shovel probes were excavated in areas adjacent to the disturbance; however, no intact components were identified. As a result, regulatory approval was recommended for construction of the mud pits at this location (Golder 2005).

Photo 40: View looking across FhNe 10 (2004)

FhNe 10 was revisited under Permit No. 07-038 during assessment of the Orion South Shaft (Golder 2007a). By this time, the mud pits had been constructed and the site area was completely disturbed. However, during the assessment of the proposed shaft area, two SRC secondary flakes were noted on the surface of a ridge approximately 100 m northwest of the original FhNe 10 site location. Due to the proximity of these flakes to FhNe 10, they were considered part of the same site. Subsequent shovel testing of this landform and additional examination of a previously cleared area at the base of the landform to the south did not identify additional

cultural materials. Because of sparse artifact recoveries and lack of intact cultural deposits, FhNe 10 was considered to be of low heritage significance, and no further work was recommended. As this site was completely impacted during shaft construction, it was not revisited during the 2008 field season.

FhNe 10 was revisited under Permit No. 07-038 during assessment of the Orion South Shaft (Golder 2007a). By this time, the mud pits had been constructed and the site area was completely disturbed. However, during the assessment of the proposed shaft area, two SRC secondary flakes were noted on the surface of a ridge approximately 100 m northwest of the original FhNe 10 site location. Due to the proximity of these flakes to FhNe 10, they were considered part of the same site. Subsequent shovel testing of this landform and additional examination of a previously cleared area at the base of the landform to the south did not identify additional cultural materials. Because of sparse artifact recoveries and lack of intact cultural deposits, FhNe 10 was considered to be of low heritage significance, and no further work was recommended. As this site was completely impacted during shaft construction, it was not revisited during the 2008 field season.

6.2.2 FhNe 12

FhNe 12 is an historic artifact/feature combination site originally identified during assessment of Kimberlite Body 145 under Permit No. 04-102 (Golder 2005). The site is located toward the northwest boundary of the Orion South Pit, approximately 800 m northwest of the tributary of the East Ravine. Identified at FhNe 12, were the remains of a cabin foundation immediately north of an overgrown vehicle trail (Photo 41).

Photo 41: View across FhNe 12

Although no structural materials remained at the feature, a raised outline was clearly visible. Surrounding this feature were pits along three of the walls. A scatter of historic artifacts was also observed on the surface. These included seven ferrous cans, one clear glass jar, one ferrous chimney stove pipe fragment, and the pieces of a

"McClary's Famous" cook stove (Photo 42). A sketch map of the site was made, but no shovel testing was carried out. The cabin was staked and flagged for avoidance.

Photo 42: View of cook stove with maker's mark

6.2.3 FhNe 22

FhNe 22 was first recorded during assessment of a proposed expansion of the DL Road in the Fort à la Corne Joint Venture Property under Permit No. 05-038 (Golder 2006a). This artifact find was noted along the road where it crossed a small ridge approximately 50 m west of an unnamed tributary of the East Ravine. This site of unknown precontact affiliation consisted of two SRC debitage located 10 m apart. Six shovel probes were excavated in the immediate area of the finds; however, all were negative for additional cultural materials or buried soils.

FhNe 22 was revisited during the Orion South Pit assessment under Permit No. 08-093. A pedestrian reconnaissance was conducted of the site area. Despite good surface visibility along the road and adjacent drill pad, no artifacts were observed (Photo 43). To determine if there were any buried components, nine shovel probes were excavated in intact areas within a 50 m by 40 m area. Probes were excavated to 70 cm below surface. No intact cultural materials or buried soils were identified in any of the probes.

Photo 43: View looking south across FhNe 22

6.2.4 FhNe 23

FhNe 23 was recorded during the same assessment of the proposed expansion of the DL Road under Permit No. 05-038 (Golder 2006a). The site is located approximately 170 m north of FhNe 22 and 100 m west of an unnamed tributary of the East Ravine. The site consisted of three SRC debitage (one primary flake, one tertiary flake, and one shatter) observed in the bladed road in an area approximately 20 m by 5 m. Five shovel probes were excavated adjacent to the road; however, all were negative for cultural materials and buried soils.

FhNe 23 was revisited during the Orion South Pit assessment under Permit No. 08-093. Pedestrian reconnaissance was conducted of the site area. Despite good surface visibility along the road and adjacent areas, no artifacts were observed (Photo 44). To determine if there were any intact components, 13 shovel probes were excavated in intact areas along the road within an 80 m by 80 m area. Probes were excavated to 70 cm below surface. No intact cultural materials or buried soils were identified in any of the probes.

6.2.5 FhNe 57

FhNe 57 was first recorded during general landscape assessments in the FALC Joint Venture Property under Permit No. 05-038 (Golder 2006a). Two lithic scatters were noted within 50 m of each other, approximately 100 m west of an unnamed tributary of the East Ravine. One scatter was found on top of a prominent jack pine ridge, and the other was located at the base of the ridge within thick poplar. A total of 16 pieces of debitage were observed between the two scatters including seven SRC secondary flakes, seven SRC shatter, and two quartzite shatter. Five shovel probes were excavated at the base of the ridge and four were excavated along the ridge-top. However, no cultural materials or palaeosols were encountered, and the site was considered to have low heritage potential.

Photo 44: View looking north across FhNe 23

FhNe 57 was revisited during the Orion South Pit assessment under Permit No. 08-093. Since the original assessment, the ridge where part of the site was located has been quarried for sand (Photo 45). The east end of the landform is currently being removed and an overburden spoil pile has been deposited on top of the ridge as a result. Surface visibility was excellent with many exposures. Two SRC flakes were noted on the ridge, one on the spoil pile, and another on the edge of the hill cut. To determine if there were any intact components, four shovel probes were placed along the top of the ridge (Photo 46). No intact cultural materials or buried soils were identified in any of the probes.

The base of the ridge was also examined where the second artifact scatter was previously recorded. One SRC secondary flake was recovered from a shovel probe 0 cm to 10 cm below surface. Based on the UTM coordinates from the original SARR form, this appeared to be in the location of the original scatter. To determine if there were any intact components, eight shovel probes were placed in a 20 m by 20 m area surrounding the positive test (Photo 47). Probes were excavated to 70 cm below surface. No intact cultural materials or buried soils were identified in any of the probes.

6.2.6 FhNe 58

FhNe 58 is an artifact find site identified during a general landscape assessment in the FALC Joint Venture Property under Permit No. 05-038 (Golder 2006a). The site is located approximately 300 m north of FhNe 57 and 100 m east of the tributary of the East Ravine. A single SRC primary flake was observed in a vehicle rut on the surface of an open, sandy ridge. Five shovel probes were excavated adjacent to the artifact find spot; however, no additional cultural materials were noted.

Photo 45: View looking west toward excavated ridge where part of FhNe 57 is located

Photo 46: Testing along FhNe 57 ridge

Photo 47: Testing FhNe 57 at the base of the ridge

6.2.7 FhNe 58

FhNe 58 is an artifact find site identified during a general landscape assessment in the FALC Joint Venture Property under Permit No. 05-038 (Golder 2006a). The site is located approximately 300 m north of FhNe 57 and 100 m east of the tributary of the East Ravine. A single SRC primary flake was observed in a vehicle rut on the surface of an open, sandy ridge. Five shovel probes were excavated adjacent to the artifact find spot; however, no additional cultural materials were noted.

FhNe 58 was revisited during the Orion South Pit assessment under Permit No. 08-093. A pedestrian reconnaissance was conducted of the site area. Despite moderate to good surface visibility in the clearing, no artifacts were observed (Photo 48). To determine if there were any intact components, nine shovel probes were excavated in a 75 m by 55 m area. No intact cultural materials or buried soils were identified in any of the probes.

6.2.8 FhNe 59

FhNe 59 is an artifact find site identified during the general landscape assessment in the FALC Joint Venture Property under Permit No. 05-038 (Golder 2006a). The site is located approximately 200 m south of FhNe 57 and 100 m west of the tributary of the East Ravine. Two SRC flakes were noted on the surface of an old exploration drill pad in a hollow, adjacent to a jack pine ridge. Four shovel probes were excavated on the ridge in the immediate vicinity of the debitage, while three probes were placed along the valley crest of the nearby drainage to the east. No additional cultural materials were observed.

Photo 48: View looking southwest across FhNe 58

This site was revisited during the Orion South Pit assessment under Permit No. 08-093. One piece of chert debitage was observed on a sandy exposure approximately 35 m northeast of an old drill hole. Fourteen shovel probes were excavated in intact areas surrounding the drill pad in an area 120 m long by 50 m wide. This included the surrounding ridge and hollow where the site was located. No intact cultural materials or buried soils were identified in any of the probes.

6.2.9 FhNe 92

FhNe 92 was originally identified in 2005 by Western Heritage as part of a heritage impact assessment for Shore Gold's Star Kimberlite underground exploration project. This site was described as an artifact and feature combination site that consisted of an abandoned cabin, two trash middens, an old stove, and associated refuse dating to the mid 20th Century (Photo 49).

FhNe 92 was revisited during assessment of the Orion South Pit under Permit No. 08-093. The site is found immediately west of the DL Road. The cabin appears to be a dilapidated, elongate shack on skids that was hauled to the location (Photo 50). A metal tow hook is located on the front of the shack and red plastic reflectors are on the back. The shack measures approximately 6 m long by 2 m wide. Wire nails and saw-cut planks were used in its construction. Remnant red paint was visible on the exterior, tar paper was on the interior walls, and metal flashing was used on the corners.

Photo 49: View looking south across FhNe 59

Photo 50: View of shack from FhNe 92

No depressions or pit features were observed near the shack; however, four can middens were noted in the vicinity. One can midden was noted approximately 20 m to the west, and two were located approximately 7 m and 22 m to the east. The latter midden also contained the remnants of an old tin stove (Photo 51). The fourth can midden was located approximately 50 m to the south. All middens contained generally the same items, including various oil cans and food tins, including many "Sun-Rype" juice cans, a "Roger's Golden Syrup" can, a "Vogue" tobacco tin, and glass Pepsi bottles. Seven shovel probes were excavated in the site area, four surrounding the shack, and three placed near the larger trash midden west of the shack. All were sterile for cultural materials.

Photo 51: View of can midden from FhNe 92

The portable shack and refuse appear to post-date the Second World War and are relatively recent (although the lack of French and metric measurements on the labelling suggests that the legible containers predate 1974). It is likely these materials relate to forestry or hunting activities carried out in the FALC Provincial Forest during the mid part of the 20th Century.

6.2.10 FhNe 131

Heritage resource FhNe 131 was identified during the HRIA of the southern portion of the Orion South Kimberlite body under Permit No. 07-259 (Golder 2007a). The site was located approximately 700 m southwest of the tributary of the East Ravine, in gently undulating terrain with a forest cover consisting of regenerating jack pine (Photo 52).

Photo 52: View looking south across FhNe 131

One SRC projectile point tip was observed on an access road to Drill Hole 140-06-062C. A visual inspection was conducted of the road and drill pad, and four shovel probes were excavated adjacent to the find. All probes were negative for cultural materials.

6.3 Overburden Storage

The majority of the Overburden Storage area was assessed under Permit Nos. 08-094 and 10-208 (Golder 2010a and 2010c). However portions of the 101 Ravine located in this footprint were assessed under Permit No. 05-038. A total of 36 heritage resources were identified in this footprint. They are discussed below.

6.3.1 FhNe 24

FhNe 24 is an artifact scatter located on the west valley crest of the 101 Ravine, approximately 3.8 km west of the Saskatchewan River. The site was identified under Permit No. 05-038. Eight SRC debitage and one SRC biface were collected from two positive shovel probes in an approximately 20 m by 10 m area. The subsequent eight shovel probes excavated in the site area were all sterile.

FhNe 24 was revisited under Permit No. 08-094. No artifacts were observed on the surface; however, two of the original shovel probes and the flagging tape marking the site were relocated. To determine the extent of the intact component, the thickly vegetated valley crest was tested with two rows of shovel probes placed 5 m apart. One shovel probe produced 26 SRC debitage from 0 cm to 20 cm below surface. An additional 11 shovel probes were excavated around this positive test in 5 m intervals; however, all were negative for cultural materials. A total of 24 shovel probes were excavated in a 40 m by 20 m area. Despite the one positive shovel test, subsequent testing of the landform indicates there is not an extensive occupation at this site.

6.3.2 FhNe 25

FhNe 25 is an artifact find site of unknown precontact affiliation located along an access road leading towards the 101 Ravine. The site occurs on a sand ridge landform in hummocky upland terrain approximately 3 km from the Saskatchewan River, and 500 m east of the 101 Ravine. One piece of SRC shatter and one SRC tertiary flake were identified in the road scar. Six shovel probes excavated in the immediate site area, one produced a single SRC debitage from the 20 cm to 40 cm B.S. No buried soils were identified in the stratigraphic profile. The site is of limited extent and artifact density. As such, its interpretive potential is considered limited.

6.3.3 FhNe 26

FhNe 26 is located on a slight ridge, approximately 1.5 km west and north of the West Perimeter Ravine and the 101 Ravine. The Saskatchewan River is located approximately 2.5 km southeast. The surrounding landscape consists of gently undulating terrain with scattered jack pine vegetation. The site is partially disturbed by a bladed trail.

FhNe 26 was first identified by Golder under Permit No. 05-038 (Golder 2006a) during an HRIA for the access road to 101 Kimberlite. A surface scatter consisting of 33 debitage of SRC and quartzite was observed along the road cut in a 40 m area. Sixteen shovel probes were placed in intact areas adjacent to the road. Three produced a total of seven debitage from 0 cm to 15 cm depth below surface. Given the potential for an intact component, the site was revisited for additional testing and artifact mapping that same year in advance of trail improvements. An additional five shovel probes were excavated in 10 cm levels adjacent to the road. Two of these probes produced nine artifacts from 0 cm to 10 cm depth below surface. The detailed mapping and testing program was followed by monitoring of road blading; however, no artifacts or features were identified in the ROW.

The site is considered to have moderate interpretive value because of the large surface scatter and intact component as indicated by the five positive shovel probes.

6.3.4 FhNe 27

FhNe 27 is located on a relatively level area, approximately 800 m west of the West Perimeter Ravine and 600 m northeast of FhNe 26. To the south of the site, the terrain begins to slope to a seasonal drainage. The surrounding hummocky landscape is vegetated with a mixture of aspen and brush near the drainage and jack pine in open areas. The Saskatchewan River is located approximately 2.5 km southeast. The site is partially disturbed by a bladed trail.

FhNe 27 was first identified by Golder under Permit No. 05-038 (Golder 2006a) during an HRIA of the 101 Kimberlite access. A surface scatter consisting of five debitage of SRC, Red River chert, and quartz was observed along the road cut. Nine shovel probes were placed in intact areas adjacent to the road. One probe was positive producing 23 debitage from 0 cm to 10 cm depth below surface. Given the potential for an intact component, the site was revisited for additional testing that same year in advance of trail improvements. An additional five shovel probes were excavated in 10 cm levels adjacent to the road. Two of these probes, excavated as a 1 m by 0.5 m unit, and placed immediately adjacent to the original positive probe, produced 39 artifacts. This included 28 debitage and nine highly fragmented bone pieces. Most significantly, however, was the recovery of fragments from two Late Side-notched projectile points. Material was observed from 0 cm to 40 cm below surface; however, it was observed that rodent disturbance was likely responsible for distributing

artifacts to lower depths from the upper 20 cm. Both projectile points and bone fragments came from the rodent disturbance at lower depths.

The detailed testing program was followed by monitoring of road blading; however, no additional artifacts or features were identified in the ROW. Given the variety of lithic material, and presence of projectile points and bone fragments, the site was considered to have high interpretive value.

6.3.5 FhNe 30

FhNe 30 is an artifact find site located on a small jack pine knoll located approximately 150 m west of the 101 Ravine and 400 m north of the confluence with an unnamed tributary. The site was originally identified under Permit No. 05-038 where two SRC debitage were observed on the surface of the knoll. Five subsequent shovel probes were excavated; all were negative for cultural materials.

FhNe 30 was revisited under Permit No. 08-094 (Photo 53). A SRC flake and old shovel probe were noted on the surface. An additional seven shovel probes were excavated in an approximately 25 m by 20 m area encompassing the site. All probes were negative for cultural materials.

Photo 53: View of FhNe 30

6.3.6 FhNe 31

FhNe 31 is located on a sand ridge that overlooks the 101 Ravine, which is located 200 m to the west. The Saskatchewan River valley is located 3 km to the southeast. The sandy upland ridge is vegetated with an open jack pine forest.

FhNe 31 was first identified by Golder under Permit No. 05-038 (Golder 2006a). A lithic scatter was noted on the surface in an approximately 30 m by 20 m area. Eight shovel probes were subsequently excavated in the area of the scatter. Three probes were positive for lithics producing 107 quartz and SRC debitage from 0 cm to 25 cm below surface, indicating the presence of a buried component.

6.3.7 FhNe 32

FhNe 32 is an artifact scatter site located approximately 300 m east of the 101 Ravine and 3.2 km northwest of the Saskatchewan River. The site was originally identified under Permit No. 05-038 when a scatter of SRC debitage was observed on the ground surface in an open jack pine forest. Six shovel probes were excavated; however, all were negative for cultural materials.

FhNe 32 was revisited under Permit No. 08-094 (Photo 54). Although no artifacts were observed on the surface, three of the original shovel probes were relocated. Eleven additional shovel probes were excavated in a 25 m by 25 m area encompassing the site; however, all were negative for cultural materials.

Photo 54: View of FhNe 32

6.3.8 FhNe 33

FhNe 33 is an artifact find site of unknown precontact affiliation located 3.1 km northwest of the Saskatchewan River and 350 m east of the 101 Ravine. Two debitage consisting of SRC and quartz flakes were noted within an approximately 20 m by 10 m area along a bladed trail. A total of five shovel probes were excavated in the immediate vicinity of the scatter; however, all were negative for buried soils or additional cultural materials. It appears that FhNe 33 has limited artifact density and no buried archaeological deposits.

6.3.9 FhNe 34

FhNe 34 is located in a low-lying area characterized by a thick aspen forest. The site is approximately 800 m north of the 101 Ravine and 2.75 km northwest of the Saskatchewan River. The site is partially disturbed by a bladed trail.

FhNe 34 was first identified by Golder under Permit No. 05-038 (Golder 2006a) during landscape surveys along the 101 Ravine. A light lithic scatter, which included a Late Side-notched projectile point, was observed along a 60 m portion of a bladed trail. Nine shovel probes were excavated within and adjacent to the trail. Only one probe in the trail was positive, producing 12 debitage of SRC and generic chert. Given the potential for an intact component, the site was revisited for additional testing that same year in advance of trail improvements. An additional three shovel probes were excavated in 10 cm levels adjacent to the road. One probe was positive producing two SRC shatter.

The detailed testing program was followed by monitoring of road blading; however, no additional artifacts or features were identified in the ROW. Although FhNe 34 consisted of a light artifact density in a largely disturbed context, it was considered to have moderate interpretive value because of the diagnostic projectile point and the potential for additional intact deposits.

6.3.10 FhNe 36

FhNe 36 is located on a ridge and terrace feature overlooking the 101 Ravine, which lies approximately 200 m to the west. The Saskatchewan River valley is located approximately 3 km southeast. The surrounding hummocky landscape is vegetated by aspen and willow in low-lying areas, while jack pine is found on elevated ridges. The site is located in an undisturbed area on the east side of the ravine where there are no existing vehicular trails.

FhNe 36 was first identified by Golder under Permit No. 05-038 (Golder 2006a) as part of surveys along the 101 Ravine. An artifact scatter consisting of 30 debitage was observed over a 130 m by 90 m area. Nineteen shovel probes were excavated along the various landforms within the area of the scatter. A cluster of three shovel probes at the base of the ridge were positive producing a total of 23 artifacts; a fourth probe was positive on a jack pine ridge located 50 m to the southwest producing one debitage; and a fifth positive probe located 80 m further south was positive producing 45 debitage. The five positive probes produced a total of 69 SRC, quartz, Red River chert, and silicified sandstone debitage. The site was considered to have high interpretive value based on the presence of intact cultural deposits, and the variety of lithic materials present.

6.3.11 FhNe 45

FhNe 45 is located on a sandy terrace on the eastern bank of the 101 Ravine. The Saskatchewan River valley is located 3.5 km to the southeast. The vegetation consists primarily of an open stand of jack pine.

The site was originally located by Golder under Permit No. 05-038 (Golder 2006a) where one piece of SRC debitage was observed on the surface. Eleven shovel probes were subsequently excavated, with three probes in a 30 m by 20 m area producing 11 SRC debitage. The site was considered to have moderate interpretive value based on the presence of buried cultural deposits in three probes.

6.3.12 FhNe 44

FhNe 44 is an artifact scatter site of unknown precontact affiliation identified under Permit No. 05-038. The site is located 3.5 km northwest of the Saskatchewan River, along the east valley crest of the 101 Ravine. The site is located on a low ridge that slopes gently toward the creek.

Five SRC debitage were observed in an approximately 10 m area on the surface of this landform. Five shovel probes were excavated in the area of the scatter with one probe producing a single SRC flake from the upper 20 cm. FhNe 44 represents a lithic scatter with a light artifact density and sparse buried component. As such, it is considered to be of low heritage significance.

6.3.13 FhNe 46

FhNe 46 is located on the east bank of the 101 Ravine overlooking the creek to the west. The Saskatchewan River is located 3.5 km to the southeast. The area is characterized by level to rolling terrain surrounded by low stabilized sand dunes and a ravine to the east. The area is vegetated by an aspen forest.

FhNe 46 was first located by Golder under Permit No. 05-038 (Golder 2006a). A single SRC flake was observed on the surface, and eight subsequent shovel probes were excavated. Three probes were positive for cultural materials producing 27 SRC and chert debitage as well as one SRC end scraper.

6.3.14 FhNe 74

FhNe 74 is located in a clearing surrounded by a thick regenerating aspen forest on the east valley crest of the 101 Ravine. The Saskatchewan River is located 3.5 km southeast. The site was first located by Golder (2006a) under Permit No. 05-038 during landscape assessments. A single Red River Chert flake was identified in the small clearing. Eight shovel probes were excavated in the area, with two producing 125 lithic artifacts including SRC, silicified sandstone, chert, and siltstone debitage.

6.3.15 FhNe 75

FhNe 75 is an artifact find site located on a terrace within the 101 Ravine and 3.5 km northwest of the Saskatchewan River. The site was first identified by Golder (2006a) under Permit No. 05-038. A single SRC shatter was found during surface reconnaissance in a previously cleared area now vegetated with tall grass. Four shovel probes were excavated surrounding the surface artifact; however, all were negative for additional cultural materials or buried soils. As such, FhNe 75 is of limited heritage significance and no further work is recommended at this location.

6.3.16 FhNe 76

FhNe 76 is an artifact find site located on the west side of the 101 Ravine, approximately 3.7 km northwest of the Saskatchewan River. The site was first identified by Golder (2006a) under Permit No. 05-038. A single SRC flake was recovered from a shovel probe placed on a ridge extending into the ravine valley. Two additional shovel probes were place in the immediate vicinity of the site but were negative for additional cultural materials.

6.3.17 FhNe 77

FhNe 76 is an artifact find site located on the west side of the 101 Ravine, approximately 3.7 km northwest of the Saskatchewan River. The site was first identified by Golder (2006a) under Permit No. 05-038. A single SRC flake was recovered on a ridge landform on the terrace of the 101 Ravine. Two additional shovel probes were place in the immediate vicinity of the site but were negative for additional cultural materials.

6.3.18 FhNe 78

FhNe 78 is a precontact artifact scatter and historic artifact scatter site located approximately 300 m west of the 101 Ravine. The site is located along an old trail following a ridge that leads to a beaver dam crossing the 101 Ravine. FhNe 78 was originally recorded under Permit No. 05-038. Ten SRC debitage were observed on the surface; however, the five subsequent shovel probes indicated there was no intact component. Approximately 140 m to the east, a scatter of historic artifacts was observed on the surface. This included the body of a Chevrolet pick-up truck body (ca. 1940s), a Leroy cook stove (McClary Pat. 1930 No. B8214 Type 310631), tin cans, glass fragments, bed frame, and a rectangular depression.

FhNe 78 was revisited to obtain more information on the historic component of the site, and determine an approximate age of occupation (Photo 55). The site was readily relocated with the surface debris including the cook stove, and the Chevrolet pick-up truck readily observable. The rectangular depression that was originally noted appears to be a bladed cut along the edge of an old two-track trail, and is not the remains of a cabin or related feature.

Photo 55: View of FhNe 78

Additional surface scatter consisted of food tins, mason jars, ceramic plates, a Copenhagen tin top, glass Pepsi bottles, green soft drink bottle, plate glass, aspirin tin, Heinz ketchup bottle, oil drum, and a chainsaw blade. Several of the glass jars were manufactured by the Dominion Glass Company and have the progressive box date code before the trademark, which post dates 1953 (Miller and Jorgensen 1986)

Two smaller depressions assumed to be refuse pits measuring approximately 2 m by 2 m were located 20 m west of the pick-up truck. Both were tested with a shovel probe. One depression was completely sterile, while

the second one produced a considerable amount of recent garbage including a glass Pepsi bottle, food tins, and plastic bread bags (Photo 56).

Photo 56: Recent garbage from FhNe 78

Based on the artifacts identified at the site, the historic component of FhNe 78 appears to be more recent and dates to the latter half of the 1900s. The debris likely relates to forestry or hunting activities and may represent a camping location along an old trail that was repeatedly used.

6.3.19 FhNe 79

FhNe 79 is an artifact find site of unknown precontact affiliation located on a long ridge structure on the west side of the 101 Ravine and 3.8 km northwest of the Saskatchewan River. The site was identified by Golder (2006a) under Permit No. 05-038. Two SRC secondary flakes were observed on the surface of the ridge. A total of 11 shovel probes were excavated on the landform, two of which produced single, SRC secondary flakes. The site area, based on the surface finds and positive shovel probes, measures approximately 200 m by 60 m.

6.3.20 FhNe 80

FhNe 80 is an artifact find site of unknown precontact affiliation located on the east valley crest of the 101 Ravine, approximately 3.5 km northwest of the Saskatchewan River. The site was identified by Golder (2006a) under Permit No. 05-038. A single SRC flake was identified on the surface in a clearing overlooking the creek. Five shovel probes were excavated at the find spot. Of these, on produced two SRC tertiary flakes and one produced one SRC shatter.

6.3.21 FhNe 81

FhNe 81 is an artifact find site found near the toe of a narrow ridge located 400 m east of the 101 Ravine and 3.5 km northwest of the Saskatchewan River. A single SRC shatter was noted on the surface of the ridge. Six shovel probes were placed along the landform to determine if buried deposits were present. However, all were negative for cultural materials or palaeosols.

6.3.22 FhNe 82

FhNe 82 is located immediately east of the 101 Ravine, approximately 4 km northwest of the Saskatchewan River. This site is situated along two interconnected, low ridges. The sandy ridges are fairly open with scattered jack pine and poplar located along them. Thicker poplar forests are located to the east and west.

FhNe 82 was first identified by Golder (2006a) under Permit No. 05-038. Thirty-one SRC debitage and one unidentifiable bone fragment were observed on the surface in two areas (A and B) within a 100 m by 60 m area. Eighteen shovel probes were originally excavated in the immediate vicinity of the flake clusters. Two probes associated with the northern flake cluster (Area B) produced 29 SRC debitage. None of the shovel probes in the southern cluster (Area A), which had a larger artifact scatter, produced artifacts.

6.3.23 FhNe 83

FhNe 83 is an artifact find site of unknown precontact affiliation located 600 m west of the 101 Ravine, and approximately 4.9 km northwest of the Saskatchewan River. A single SRC secondary flake was observed at the base of a low sand hill in the scar of an overgrown vehicle trail leading southeast towards the 101 Ravine. Five shovel probes were excavated adjacent to the artifact find; however, all were negative for cultural materials.

6.3.24 FhNe 138

FhNe 138 is an artifact scatter site located approximately 280 m west of the 101 Ravine. The site is situated within a clearing of thick aspen in a low area bordering a muskeg (Photo 57). Vegetation consists of thick grass and willow with aspen and spruce saplings. Surface visibility was poor as result of the vegetation.

A total of seven shovel probes were excavated at the site and nine SRC debitage were collected. Three debitage were first identified 20 cm to 30 cm below surface in a probe while shovel testing the clearing. These artifacts corresponded with a dark soil layer that may represent a buried palaeosol. Four shovel probes were subsequently placed at 5 m intervals in the four cardinal directions surrounding this probe. Shovel probes to the east and west were also positive, producing two SRC debitage each. Additional shovel probes on either side of these probes were negative for cultural materials.

The soil stratigraphy of this site was more complex than elsewhere in the Overburden Disposal area. The site was identified after a heavy rain the previous day and the soils were quite saturated. Water seems to drain into this low area resulting in more episodes of deposition resulting in complex stratigraphy with organic sandy loams. The soil profile of the shovel probes were generally as follows:

- 0 cm to 7 cm black organic loam;
- 7 cm to 23 cm tan and grey mottled sand;
- 23 cm to 25 cm black loam; and
- 25 cm to 40+ cm tan water saturated sand with red iron stains.

Photo 57: View of FhNe 138

FhNe 138 is unique from other sites in the project area in that there is potential for buried, discernable palaeosols. Three positive shovel probes produced debitage that may have come from one of the buried palaeosols.

6.3.25 FhNe 139

FhNe 139 is an artifact scatter site located approximately 1.1 km west of the 101 Ravine. The site is situated on a prominent jack pine ridge overlooking a low aspen and muskeg area to the east (Photo 58). The site was observed in a bulldozer push coming off an old logging trail. Vegetation consisted of mature jack pine with little understory, resulting in good surface exposure.

Over 50 SRC debitage were observed in a spoil pile from a bulldozer push on the ridge. A shovel probe was placed immediately adjacent to the scatter, and three additional debitage were collected from approximately 25 cm below surface within yellow sand. There was no evidence of a buried palaeosol. A series of five shovel probes placed at 5 m intervals were subsequently excavated on either side of the positive probe, and adjacent to the old trail and disturbance. A testing program was also conducted along the entire ridge; however, it did not identify any intact components. Fifteen shovel probes in a 95 m by 75 m area were all negative for cultural materials.

Photo 58: View of FhNe 139

6.3.26 FhNe 143

FhNe 143 is an artifact scatter site located approximately 400 m east of the 101 Ravine (Photo 59). The site is situated on a gently undulating to flat jack pine upland in an old forest fire burn area. Vegetation consists of grass cover, willow, and sparse jack pine saplings. The site is near the interface with the aspen forest that marks the transition to the ravine. One SRC debitage was noted in an exposure on the surface.

To determine if intact components were present, a shovel probe was placed adjacent to the artifact find. A total of 88 pieces of debitage representing all stages of lithic reduction were found approximately 20 cm to 30 cm below surface. Eight additional shovel probes were placed at 5 m intervals in the four cardinal directions around the positive probe, two in each direction. All were negative for cultural materials.

6.3.27 FhNe 159

FhNe 159 is an artifact find site located on a jack pine ridge near the southeast corner of the Overburden Storage area. The ridge overlooks a mixed jack pine and aspen forest that eventually leads to the Saskatchewan River valley 2.5 km to the southeast (Figure 5; Photo 60). The site is located approximately 400 m south of the 101 Ravine road and 250 m north of a tributary of the 101 Ravine.

One SRC primary flake and one shatter were observed on the surface. Nine shovel probes were excavated in a 15 m by 25 m area surrounding the debitage. All probes were negative for cultural materials.

Photo 59: View of FhNe 143

Photo 60: View of FhNe 159

6.3.28 FhNe 160

FhNe 160 is an artifact scatter site that was observed on an overgrown forestry road and bulldozer push. The site is located along a narrow ridge covered with jack pine, approximately 200 m west of FhNe 159 and 280 m northwest of a tributary of the 101 Ravine (Figure 5; Photo 61).

Photo 61: View of FhNe 160

Over 30 pieces of debitage were observed along the disturbed trail. This included a concentration of 22 SRC debitage that was trowelled to approximately 5 cm depth below surface. Sixteen shovel probes were excavated in a 15 m by 40 m area surrounding the concentration and adjacent to the trail. Two of the probes were positive for cultural materials, producing debitage (n=9), and fragments of granite (n=2) possibly representing FCR. It was evident, however, that these probes were in disturbed overburden from previous road clearing. The remaining 14 shovel probes placed in intact areas were negative for cultural materials. It appears FhNe 160 was intersected by the forestry road and largely disturbed.

6.3.29 FhNe 161

FhNe 161 is an artifact find site located on the same ridge complex as FhNe 159 and 160. The site is located approximately 190 m south of an access road to the 101 Ravine road and 530 m northwest of a tributary of the 101 Ravine (Figure 5; Photo 62).

One siltstone core fragment was collected from a shovel probe approximately 18 cm depth below surface. The positive probe was on the very edge of the ridge crest, which sloped immediately to the south. Eight shovel probes were excavated in a 15 m by 20 m area surrounding the artifact find. All probes were negative for cultural materials.

Photo 62: View of FhNe 161

6.3.30 FhNe 164

FhNe 164 is an artifact find site located along an existing trail near the northeast boundary of the Overburden Storage area. The site is approximately 1 km south of Lars Road and 460 m west of the 101 Ravine (Figure 5; Photo 63). A single piece of debitage was observed along the bladed trail that traverses gently undulating to flat terrain in open jack pine. Eight shovel probes were excavated in a 10 m by 15 m area surrounding the artifact find in intact areas adjacent to the trail. All probes were negative for cultural materials.

6.3.31 FhNe 165

FhNe 165 is an artifact find site located along an overgrown trail in the south-central portion of the Overburden Storage area. The site is approximately 1.2 km south of Lars Road and approximately 50 m west of a tributary of the 101 Ravine (Figure 5; Photo 64). A single piece of SRC debitage was observed along the trail on the valley crest overlooking the ravine.

Four shovel probes were excavated in a 5 m by 10 m area surrounding the surface find. Exposures created by a bulldozer push were also examined. All probes were negative for cultural materials and no additional artifacts were observed along the exposed surface.

Photo 63: View of FhNe 164

Photo 64 View of FhNe 165

6.3.32 FhNf 50

FhNf 50 is an artifact find site located along the northern boundary of the Overburden Storage area, approximately 90 m south of an unnamed creek (Figure 5; Photo 65). The site was originally identified under Permit No. 05-038 and consisted of three SRC shatter and one SRC primary flake recovered from a single positive shovel probe (Golder 2006a). Six additional shovel probes were placed around this find during this investigation, all of which were negative for cultural materials.

Photo 65: View of FhNf 50

FhNf 50 was revisited during the current HRIA. In order to confirm that no intact components were present, the original positive probe was relocated and five additional shovel probes were excavated in the immediate vicinity. One probe adjacent to the original positive probe produced a single SRC flake 0 cm to 10 cm below surface. All additional probes were negative for cultural materials.

6.3.33 FhNf 59

FhNf 59 is located on a terrace, approximately 150 m west of the 101 Ravine. The Saskatchewan River is located approximately 3.5 km south east. The surrounding hummocky landscape consists of an aspen forest in low-lying and ravine areas, and an open jack pine forest in various stages of regeneration in upland areas. The site is located in an undisturbed area on the west side of the ravine where there is no vehicular access.

FhNf 59 was first identified by Golder under Permit No. 05-038 (Golder 2006a) as part of surveys along the 101 Ravine. A lithic scatter consisting of 40 SRC, Red River chert, black pebble chert, and chalcedony debitage was observed in an approximately 100 m by 50 m area. One SRC end scraper was also collected from a tree throw.

Fifteen shovel probes were excavated in the area of the scatter, and three were positive producing nine pieces of debitage.

6.3.34 FhNf 62

FhNf 62 is an artifact find site located approximately 2 km west of the 101 Ravine along Lars Road. One SRC shatter was observed on the edge of the road within an old forestry cut block (Photo 66). The topography was generally flat with vegetation consisting of open grass with aspen and jack pine saplings. The grass cover was thin resulting in good surface exposure. Five shovel probes were placed in intact areas adjacent to the road; however, no additional artifacts were observed.

6.3.35 FhNf 63

FhNf 63 is an artifact scatter site located on the southern edge of a jack pine upland overlooking a broad valley lowland, approximately 350 m west of the 101 Ravine and 3.9 km northwest of the Saskatchewan River. While assessing this landform, four SRC debitage were collected from a shovel probe 0 cm to 20 cm below surface. To determine the extent of the site, an additional seven shovel probes were excavated at approximately 5 m intervals surrounding the positive probe in a 30 m by 17 m area. All were negative for cultural materials.

6.3.36 FhNf 64

FhNf 64 is an artifact scatter located on an upland area 500 m west of 101 Ravine and 1.4 km southeast of Lars Road. Four SRC debitage and one core were observed on the surface of an open grass and shrub area between two hills (Photo 67). To determine the presence of intact components, nine shovel probes were excavated in 5 m intervals along a north-south and east-west axis in a 30 m by 40 m area. All were negative for cultural materials.

6.3.37 Recent Cabins

Two recent cabin sites were also recorded during the survey of the Overburden Disposal area. The first consisted of two collapsed log cabins (NAD 83 13U 510240E 5898978N) located approximately 450 m north of Lars Road, and 500 m south of the north boundary of the Overburden Disposal. The cabins (spaced 20 m apart) were situated on a slight jack pine upland adjacent to a low aspen area. The cabins are 100 m southwest of an overgrown two-track trail. The cabins were built using saddle-notch construction with a chain saw. Finished 2x6 boards were used for the doors and window frames of Cabin 1, and wire nails and spikes were used in construction (Photo 68). Two depressions were located northwest of Cabin 1. A total of 17 shovel probes were excavated within the cabin and pit features as well as areas in between the cabins; however, all were sterile for cultural materials. Given the modern construction methods, it appears these cabins post-date the Second World War. As a result, they were not assigned a Borden Number.

A second cabin site (NAD 83 13U 511674E 5896001N) was located approximately 100 m northeast of FhNe 32 and east of the East Ravine. Two cabin outlines were observed north of an overgrown trail, each approximately 5 m by 5 m in size. Recent artifacts were observed on the surface including a scatter of tin cans, a fragment of a ceramic plate, a steel bed frame, the bottom of a wash tub, truck parts (clutch and door handle), a metal chair frame, fragments of window glass, plywood and 2x4 scraps, and three kerosene cans (Photo 69). Two shovel probes were placed inside both cabin features; however, no additional artifacts were recovered. The surface artifacts suggest a recent occupation that post-dates the Second World War. As a result, the site was not assigned a Borden Number.

Photo 66: View of FhNf 62

Photo 67: View of FhNf 64

Photo 68: Cabin 1

Photo 69: Cabin 2

6.4 Processed Kimberlite Containment Facility

The PKCF area was not subject to HRIAs prior to 2008. During the 2008 assessment 1,080 ha were examined and 1,545 shovel probes were excavated. Three new heritage resources were identified. The footprint for the PKFC was reduced in 2010 to its current size (494 ha) and two of these heritage resources now occur immediately east of the eastern boundary (FhNe 152 and 156). These sites are discussed below.

6.4.1 FhNe 152

FhNe 152 is an artifact find site approximately 80 m west of an unnamed tributary of English Creek. The site is located near the headwaters of this drainage, approximately 4 km north of the Saskatchewan River. One SRC primary flake was observed on an old, bladed logging trail along the east facing valley crest (Photo 70). Surface visibility was good with vegetation consisting of a sparse grass cover, deadfall, and regenerating jack pine.

Photo 70: View of FhNe 152

To determine if there were any intact components, a total of seven shovel probes were placed in 5 m intervals extending in the four cardinal directions from the artifact find. All probes were negative for cultural materials.

6.4.2 FhNe 156

FhNe 156 is an artifact find site located on the east facing valley crest of an unnamed tributary of English Creek (Photo 71). One SRC core was collected from the top 20 cm below surface during shovel testing of the valley feature. The environment was similar to FhNe 152; however, the ravine valley was more deeply incised at this location.

Photo 71: View of FhNe 156

To determine if there were additional intact components, seven shovel probes were subsequently placed at 5 m intervals in the four cardinal directions from the positive probe. All probes were negative for cultural materials.

6.5 Coarse Processed Kimberlite Storage

The CPKS area was not subject to previous HRIAs prior to 2008. During the 2008 assessment 61 ha were examined (Golder 2010b). The footprint was subsequently expanded to 240 ha and additional assessment was carried out in 2010 (Golder 2010c). A total of 237 shovel probes were excavated and two new heritage resources were identified (FhNe 157 and 162).

6.5.1 FhNe 157

FhNe 157 is an artifact find site located approximately 3.3 km north of the Saskatchewan River on a south facing upland edge, overlooking a large muskeg that serves as the headwaters for both the Wapiti Ravine and the FALC Ravine (Photo 72). One SRC flake was noted on the ground surface while assessing the landform. To determine the presence of an intact component, a total of seven shovel probes were excavated along an east-west and north-south axis surrounding the artifact find. All probes were negative for cultural materials.

Photo 72: View of FhNe 157

6.5.2 FhNe 162

FhNe 162 is an artifact find site located along an existing vehicle trail near the southeast corner of the CPKS area. The topography is characterized by gently undulating terrain in a mature jack pine forest. The site is approximately 1.2 km east of the former Melfort Ferry Road and 800 m northwest of the Saskatchewan River (Figure 5; Photo 73). Two SRC flakes were observed along the exposed trail. Eight shovel probes were excavated in a 10 m by 15 m area adjacent to the finds in intact areas beside the trail. All probes were negative for cultural materials and no additional artifacts were observed in exposures along the trail.

6.6 Duke Ravine Reservoir and Polishing Pond

The Duke Ravine Reservoir and Polishing Pond were additions to the project footprint in 2010. Portions of the Duke Ravine were previously assessed as part of general landscape surveys under Permit No. 05-038 (Golder 2006a), and as part of the PKCF surveys under Permit No. 08-094 (Golder 2010a). The 2010 survey under Permit No. 10-208 (Golder 2010c) focused on remaining previously unassessed areas. As a result of the 2008 and 2010 surveys, two heritage resources were revisited (FhNe 64 and 65) in the Duke Ravine Reservoir, and one new site (FhNe 163) was identified within the Polishing Pond.

Photo 73: FhNe 162

6.6.1 FhNe 64

FhNe 64 is located on the east valley crest of the Duke Ravine, approximately 2.3 km north of the Saskatchewan River. The site was originally identified under Permit No. 05-038. Two SRC debitage were observed on the surface and one was collected from a positive shovel probe. The remaining six shovel probes were negative.

FhNe 64 was revisited under Permit No. 08-094. Although no artifacts were observed on the surface, the original shovel probes were evident. An additional eight shovel probes were excavated in a 40 m by 20 m area encompassing the site and adjacent to an old truck trail. All probes were sterile for cultural materials.

6.6.2 FhNe 65

FhNe 65 is an artifact find site located 40 m east of Duke Ravine valley crest and approximately 2 km north of the Saskatchewan River. The site was originally identified under Permit No. 05-038. Two SRC debitage were observed on the surface in a small clearing within the jack pine forest. Five shovel probes were excavated in the area; however, all were negative for cultural materials.

FhNe 65 was revisited under Permit No. 08-094. No artifacts were observed on the surface. An additional six shovel probes were excavated in a 20 m by 20 m area encompassing the site. All probes were sterile for cultural materials.

6.6.3 FhNe 163

FhNe 163 is an artifact find site. Two SRC flakes were observed on the surface along the eastern crest of Duke Ravine Reservoir, approximately 3.2 km northwest of the Saskatchewan River (Figure 5; Photo 74). Nine shovel

probes were excavated in a 15 m by 20 m area surrounding the find. All probes were negative for cultural materials and no additional artifacts were observed along the crest.

Photo 74: View of FhNe 163

6.7 Sewage Lagoon

The Sewage Lagoon footprint was added in 2010; however, it falls within the former footprint area for the Unprocessed Kimberlite Stockpile that was assessed under Permit No. 08-094. Thirteen shovel probes were excavated in the 3 ha area. No heritage resources were identified in conflict with the lagoon.

6.8 Plant Site

Portions of the Plant Site were previously assessed under Permit Nos. 06-103 and 07-292 as part of the East Ravine surveys. During the 2008 assessment, the remaining unassessed areas of the 46 ha Plant Site were examined and 284 shovel probes were excavated. No new heritage resources were identified, but one previously recorded site, FhNe 126, was revisited. In 2010 the Plant Site footprint was reduced to a 37 ha area. As a result, no heritage resources are presently in conflict.

6.8.1 FhNe 126

FhNe 126 is an artifact scatter originally recorded under Permit No. 06-103 along the East Ravine Road (Photo 75). It was revisited under Permit No. 07-292 (Golder 2007e). The lithic scatter extends for approximately 100 m along the road where over 50 debitage were observed and two biface tools collected.

Photo 75: View of FhNe 126

The site was revisited a third time under Permit No. 08-094. A SRC biface (Photo 56; Table 11) was collected from the surface, and additional shovel testing was carried out. Three positive shovel probes suggest that intact portions of this site may remain in two areas. Area A is found toward the south end of the recorded surface scatter, and approximately 20 m east of the road in thick regenerating jack pine. Area B is found approximately 80 m east of Area A in more mature jack pine, and was first identified by a positive shovel probe during assessments under Permit No. 07-292.

One shovel probe in Area A produced a quartz end scraper (Photo 56; Table 11) and one SRC debitage 0 cm to 20 cm below surface. Eight shovel probes were subsequently excavated around this probe in 5 m intervals, two each in the four cardinal directions. All were negative for cultural materials.

The original positive shovel probe from Area B was relocated during the current assessment. A total of 16 shovel probes were subsequently placed in a 30 m by 17 m area surrounding this probe. Two of these were positive, each producing one SRC debitage from the top 20 cm.

When the artifact scatter and positive shovel probes are considered together, FhNe 126 represents a large site extending over an approximately 100m by 140 m area and has produced at least five lithic tools. Shovel testing adjacent to the road suggests there may be sparse, but intact portions of the site remaining in two areas.

Photo 76: End Scraper (left) and Biface (right) from FhNe 126

Table 11: Metric Attributes of Tools From FhNe 126

Cat No.	Tool Type	Weight (g)	Max. Length (mm)	Max. Width (mm)	Max. Thickness (mm)
1	End scraper	5	29.83	25.5	4.45
2	Biface	10.5	45.04	27.31	8.7

6.9 Runoff Pond

The Runoff Pond footprint was also added in 2010; however, it falls within an area that was assessed under Permit No. 05-038. As a result of this previous assessment, no heritage resources were identified in conflict with the Runoff Pond.

7.0 SUMMARY OF HERITAGE RESOURCES

As a result of archaeological assessments carried out between 2004 and 2010, 108 heritage resources have been identified in the proposed Star-Orion South Diamond Project footprint (Table 12). As a general comment, the vast majority of sites are located along drainage and ravine features. There also appears to be a greater density of sites along ravines as they approach their confluence with the Saskatchewan River.

Approximately half of the sites (n=55) are located in the Star Open Pit area. This pit centers on two creek features, the East Ravine and West Ravine. The majority of the sites are associated with these drainage valleys. The Star Open Pit is the project footprint nearest the Saskatchewan River, which may explain the greater number of sites. It should also be noted, however, that there was greater disturbance and resulting ground exposure from advanced kimberlite exploration in the Star Open Pit area, which may also be a factor in visibility and the increased number of identified sites.

Table 12: Summary of Heritage Resources Found in Star-Orion South Project Footprint

Project Area	Total
Star Open Pit	55
Orion South Pit	9
Overburden Storage	36
Processed Kimberlite Containment Facility	2
Coarse Processed Kimberlite Storage	2
Plant	1
Duke Ravine Reservoir	3
Sewage Lagoon	0
Runoff Pond	0
Total	**108**

In contrast, only nine sites were identified in the Orion South Pit. The Orion South Pit was also subject to intense kimberlite exploration that resulted in increased exposure and visibility; however, it is located 4.5 km north of the Saskatchewan River. This greater distance from the Saskatchewan River may explain the reduced number of recorded sites. The majority of heritage resources (n=5) were associated with a tributary of the East Ravine.

Thirty-six sites were identified in the Overburden Storage area, most (n=24) occurring within or along the valley crest and associated tributaries of the 101 Ravine. The sites significantly diminish the further one gets from these drainages. The remaining eight sites are found inland either on prominent hills (FhNe 159 to 160), or on generally flat, featureless terrain (FhNe 26, 27, and 164 and FhNf 62).

Only two sites were identified in the PKCF area. This was a little unexpected, as the headwaters of the Duke Ravine are found near the western boundary, and a tributary of English Creek is present near the east boundary. However, most of this footprint encompasses the generally featureless terrain in between the two drainage features. The two sites (FhNe 152 and 156) were associated with a tributary of the English Creek immediately outside the eastern boundary.

Two sites (FhNe 157 and 162) were recorded in the CPKS area. Although portions of the CPKS are located within 1 km of the Saskatchewan River, the reduced number of sites can be partially attributed to the local environment. Much of the central and east half of the footprint encompasses a muskeg that serves as the headwaters for the FALC Ravine and Wapiti Ravine. FhNe 157 is located on an upland overlooking the muskeg near the north boundary, while FhNe 162 is located in mature jack pine 800m north of the Saskatchewan River and in between FALC Ravine and Wapiti Ravine.

The Plant Site area is located in rugged upland terrain in between the East Ravine and Duke Ravine. One site was identified within the original plant footprint along the East Ravine; however no sites are found in the current footprint boundaries. Three sites were identified along the valley crest of the Duke Ravine Reservoir and Polishing Pond. This further reinforces the association of heritage resources with drainage features in the project area.

Heritage resources in the project footprint are summarized by site type in Table 13. A more detailed summary of known sites and their characteristics can be found in Appendix B. Almost all of the heritage resources are Precontact, with only two historic sites identified. The historic feature/artifact scatter sites consist of cabins and

refuse dating to the 20th Century. They appear to relate to more recent hunting or forestry activities carried out by locals who frequented the FALC Provincial Forest. The remaining 106 sites represent Precontact sites that can be divided into three general types based on the Heritage Resources Branch criteria: Artifact Find, Artifact Scatter, and Artifact Feature/Combination.

Table 13: Summary of Heritage Resources by Site Type in Project Area

Site Type	Definition	Frequency	% of Sample
Artifact find	Archaeological sites consisting of 5 or fewer artifacts. An artifact is any object used or modified by people (e.g. stone tools, pottery sherds, lithic flakes).	47	43
Artifact scatter	Archaeological sites consisting of 6 or more artifacts.	57	53
Artifact/Feature combination	Archaeological sites consisting of both artifacts and features. A feature is the remains of any non-portable human activity that can not be removed from a site without disturbing it (e.g., hearth, boiling pit, stone circle,).	2	2
Historic Feature/Scatter	Archaeological sites consisting of both historic features and artifacts (e.g., cabin, cellar depression with artifacts of European or Euro-Canadian manufacture).	2	2
	Total	**108**	**100**

Artifact Find Sites consist of one to five artifacts that are confined to small, well-defined areas. Artifacts can include such things as stone flakes, formed tools, or modified bone. Artifact finds are commonly interpreted as areas of limited use, in which activities were engaged in over a short period of time and that left behind minor cultural residue. Forty-seven sites or 43% of the sites found in the project footprint are artifact find sites.

Artifact Scatter Sites consist of six or more artifacts and can represent behaviours indicative of more intensive use of an area than artifact find sites. The behaviours may be associated with activities such as lithic reduction for tool production, or game butchering/processing. In such instances, a person or group of people often required multiple resources or a diverse tool kit to complete their activities and, as such, can leave behind a greater density and variety of artifacts. Fifty-seven sites or 53% of recorded sites in the project footprint are artifact scatters.

Artifact/Feature Combination Sites consist of artifacts associated with at least one feature. The presence of a feature is suggestive of increasingly complex cultural behaviours of longer duration, such as encampments. Such sites can include various defined activity areas as represented by loci with variable artifact densities and features such as boiling pits, hearths, or dwellings. Two sites or 2% of the sites recorded in the project footprint are artifact/feature combination sites. This includes FhNe 88, where debitage and FCR concentrations may indicate an activity area and hearth; and FhNe 91 where debitage and soil staining may also represent a lithic reduction area and hearth.

The Precontact heritage resources are dominated by small artifact finds and scatters comprised almost exclusively of SRC debitage representing lithic reduction areas. Eleven of the sites produced diagnostic projectile points indicating occupation of the region from approximately 7,500 to 200 rcybp (Table 14). The Middle Precontact Period is best represented, with Early Side-notched, McKean, Hanna, and Pelican Lake points found at eight sites. The Late Precontact Period is represented by Avonlea and Late Side-notched varieties found at three sites.

Table 14: Summary of Precontact Heritage Resources in Project Area with Culturally Diagnostic Projectile Points

Borden No.	Site Type	Diagnostic Projectile Points	Age (rcybp)
FhNe 27	Artifact Scatter	Late Side-notched (n=2)	1,200 to 200
FhNe 34	Artifact Scatter	Late Side-notched	1,200 to 200
FhNe 86	Artifact/Feature Combination	Hanna	4,100 to 3,100
FhNe 87	Artifact Find	Pelican Lake	3,100 to 2,000
FhNe 88	Artifact Scatter	Besant	2,000 to 1,150
		Pelican Lake	3,100 to 2,000
		Hanna	4,100 to 3,100
FhNe 90	Artifact Scatter	Hanna	4,100 to 3,100
FhNe 98	Artifact Scatter	Early Side-notched	7,500 to 5,000
FhNe 111	Artifact Scatter	Hanna	4,100 to 3,100
FhNe 114	Artifact Scatter	Early Side-notched	7,500 to 5,000
FhNe 115	Artifact Scatter	McKean lanceolate	4,100 to 3,100
FhNe 145	Artifact Find	Avonlea	1,800 to 1,150

8.0 HERITAGE RESOURCE EVALUATION

When considering the significance or interpretational value of the heritage resources located in the Star-Orion South Diamond Project area, it is useful to examine what archaeological questions or research goals could be addressed if additional archaeological work was carried out at these sites. With this in mind, it should be noted that previous research in central Saskatchewan near the FALC Provincial Forest, including the Nipawin Reservoir Study (Finnigan et al. 1983) and the Saskatchewan Forks Survey (Wilson 1982), focused almost exclusively on the Saskatchewan River valley. A mitigation program in the Star-Orion South Diamond Project area would provide an opportunity to explore Precontact activities and landscape utilization outside of this river valley complex. The results of a mitigation program could then be compared and contrasted with these previous studies.

Five general research questions of interest include:

- When was the area being occupied?
- Who was occupying the Study Area? What archaeological cultures are represented?
- What activities were they undertaking?
- What areas within the Study Area were people exploiting or occupying?
- How might the history of occupation and landscape use be related to changing environments?

With regard to the latter question, it is interesting to note that during the Altithermal, a period of increased temperature and aridity in North America, the southern edge of the boreal forest was approximately 100 km further north than it is today (Bobrowsky et al. 1990; Vance et al. 1995). The study area would have been a parkland/grassland environment during this period. Thus far, there is evidence for greater occupation in the FALC Provincial Forest during the Middle Precontact period, which corresponds with the Altithermal, than any other Period. It is also interesting to note that in contrast to the Saskatchewan River valley proper, where large

Late Woodland pottery-bearing sites occur, none have been recorded to date in the project area (D. Meyer, pers. comm. 2008). This may suggest that a different pattern of occupation was occurring outside the Saskatchewan River valley during this later period.

Significance Rating

In determining which archaeological sites might best address these research questions, all heritage resources in the project footprint were given a heritage potential rating based on their potential interpretive value. A summary of all sites located in the project area, their characteristics and rating is included in Appendix A. Criteria considered in the evaluation process included:

- presence of cultural diagnostics;
- presence of features or activity areas;
- site size and artifact density;
- variety of artifact classes present (i.e., tools, debitage, and FCR);
- quality of artifact preservation (i.e., presence of bone);
- uniqueness of site (i.e., rare site type, age, or location); and
- condition of the site (degree of previous disturbance; presence of intact/buried component indicated by positive shovel tests).

Sites were considered to have high potential if they contained intact cultural components with temporally diagnostic tools or known features. The presence of these criteria will specifically aid in addressing research questions regarding culture history, as well as resource and landscape utilization in the project area.

Sites considered to have moderate potential were those exhibiting a combination of criteria including a high artifact density, the presence of a variety of artifact classes (i.e., a combination of lithic tools, debitage, FCR, or bone), site size, or uniqueness in terms of topographic location (i.e., inland hill feature, valley crest). These criteria may be indicative of more complex site structure, and further investigation may reveal features, activity areas, or culturally diagnostic tools that will enhance interpretations.

Sites were considered to have a low potential based on sparse artifact density, small site size, or high degree of site disturbance. This includes artifact finds ($\leq$5 artifacts) and sites demonstrated to have no or limited intact cultural components. The interpretive value of these sites is considered low.

Table 15 summarizes the number of sites in each of the project areas and their associated significance rating. The majority of sites (N=80 or 73%) are considered to have low potential and limited knowledge would be gained from additional excavation. These sites are considered adequately mitigated through previous assessment programs, collection of formed tools, site mapping, and submission of SARR forms to the Heritage Resources Branch.

Table 15: Summary of Heritage Resources Potential in Project Area

Heritage Potential	High	Moderate	Low	Total
Star Open Pit	6	7	42	**55**
Orion South Open Pit	0	1	8	**9**
Overburden Storage	3	10	23	**36**
PKCF	0	0	2	**2**
CPKS	0	0	2	**2**
Plant	0	1	0	**1**
Duke Ravine Reservoir and Polishing Pond	0	0	3	**3**
Sewage Lagoon	0	0	0	0
Runoff Pond	0	0	0	0
Total	**9**	**19**	**80**	**108**
% of Sample	**8.3**	**17.6**	**74.1**	**100**

The remaining 28 heritage resources consist of high (N=9) and moderate (N=19) potential sites that are identified in Table 16. The sites were selected based on the presence of a significant surface scatter with the potential for, or evidence of, intact deposits; the presence of a variety of artifact classes or diagnostic artifacts; or evidence for potential features such as hearths or boiling pits. The potential of these 28 sites to increase our understanding of past life ways in the project area is considered greater. As a result, additional excavation at these sites would be warranted before potential impacts occur.

Table 16: Summary of High and Moderate Potential Heritage Resources Located in Project Area

Borden No.	Project Area	Type	Landscape Feature	Diagnostic Artifacts	Heritage Potential
FhNe 11	Star Open Pit	Artifact Scatter	Upland/Hilltop	N/A	Moderate
FhNe 12	Orion South Pit	Historic Cabin	Upland	20th Century refuse	Moderate
FhNe 14	Star Open Pit	Artifact Scatter	Muskeg Edge	N/A	Moderate
FhNe 26	Overburden Storage	Artifact Scatter	Upland	N/A	Moderate
FhNe 27	Overburden Storage	Artifact Scatter	Upland	Late Side-notched (n=2)	High
FhNe 31	Overburden Storage	Artifact Scatter	101 Ravine	N/A	Moderate
FhNe 34	Overburden Storage	Artifact Scatter	Upland	Late Side-notched	Moderate
FhNe 36	Overburden Storage	Artifact Scatter	101 Ravine	N/A	High
FhNe 45	Overburden Storage	Artifact Scatter	101 Ravine	N/A	Moderate
FhNe 46	Overburden Storage	Artifact Scatter	101 Ravine	N/A	Moderate
FhNe 49/104	Star Open Pit	Artifact Scatter	East Ravine	N/A	Moderate
FhNe 74	Overburden Storage	Artifact Scatter	101 Ravine	N/A	Moderate
FhNe 77	Overburden Storage	Artifact Scatter	101 Ravine	N/A	Moderate
FhNe 82	Overburden Storage	Artifact Scatter	101 Ravine	N/A	Moderate
FhNe 87	Star Open Pit	Artifact Scatter	East Ravine	Pelican Lake	High
FhNe 88	Star Open Pit	Artifact/Feature	East Ravine	Besant Pelican Lake Hanna	High

FhNe 90	Star Open Pit	Artifact Scatter	East Ravine	Hanna	High
FhNe 91	Star Open Pit	Artifact/Feature	East Ravine	N/A	High
FhNe 98	Star Open Pit	Artifact Scatter	West Ravine	Early Side-notched	High
FhNe 102	Star Open Pit	Artifact Scatter	East Ravine	N/A	Moderate
FhNe 115	Star Open Pit	Artifact Scatter	East Ravine Tributary	McKean	High
FhNe 120	Star Open Pit	Artifact Scatter	East Ravine	N/A	Moderate
FhNe 126	Plant Site	Artifact Scatter	East Ravine	N/A	Moderate
FhNe 135	Star Open Pit	Artifact Scatter	West Ravine	N/A	Moderate
FhNe 138	Overburden Storage	Artifact Scatter	101 Ravine	N/A	Moderate
FhNe 143	Overburden Storage	Artifact Scatter	101 Ravine	N/A	Moderate
FhNe 155	Star Open Pit	Artifact Scatter	Upland	N/A	Moderate
FhNf 59	Overburden Storage	Artifact Scatter	101 Ravine	N/A	High

9.0 CLOSURE

Between 2004 and 2010, HRIAs were carried out under 19 Archaeological Investigation Permits relating to diamond exploration and development in the FALC Provincial Forest. This resulted in the recording of 190 heritage resources, 108 of which are located in the proposed Star-Orion South Diamond Project footprint. A significance evaluation of these known sites suggest that 80 have low heritage interpretive potential, while the remaining 28 have moderate to high interpretive potential.

We trust the above meets your present requirements. If you have any questions or require additional details, please contact the undersigned.

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APPENDIX A

Summary of Known Heritage Resources in Conflict with the Star-Orion South Diamond Project

Borden No.	Project Area	Type	No. of Tests	Positive Test	Artifacts from Tests	Diagnostics	Site Condition	Heritage Potential Rating
FhNe 010	Orion South	Artifact Scatter	16	0	0	0	Disturbed	Low
FhNe 011	Star Open Pit	Artifact Scatter	4	3	170+ debitage, FCR, core	0	Partially disturbed by trail	Moderate
FhNe 012	Orion South	Historic	3	0	0	20th Century refuse	Undisturbed	Moderate
FhNe 013	Star Open Pit	Artifact Find	24	0	0	0	Undisturbed	Low
FhNe 014	Star Open Pit	Artifact Scatter	28	5	12 debitage	0	Disturbed by trail	Moderate
FhNe 017	Star Open Pit	Artifact Find	5	0	0	0	Disturbed by trail	Low
FhNe 021	Star Open Pit	Artifact Scatter	5	0	0	0	Disturbed	Low
FhNe 022	Orion South	Artifact Find	15	0	0	0	Disturbed by road	Low
FhNe 023	Orion South	Artifact Find	18	0	0	0	Disturbed by road	Low
FhNe 024	Overburden Storage	Artifact Scatter	33	3	35	0	Undisturbed	Low
FhNe 025	Overburden Storage	Artifact Find	6	1	1	0	Disturbed by road	Low
FhNe 026	Overburden Storage	Artifact Scatter	21	5	16	0	Partially disturbed by trail	Moderate
FhNe 027	Overburden Storage	Artifact Scatter	11	1	62	2 Late Side-notched points	Partially disturbed by trail	High
FhNe 030	Overburden Storage	Artifact Find	7	0	0	0	Undisturbed	Low
FhNe 031	Overburden Storage	Artifact Scatter	8	3	>100 debitage	0	Undisturbed	Moderate
FhNe 032	Overburden Storage	Artifact Scatter	11	0	0	0	Undisturbed	Low
FhNe 033	Overburden Storage	Artifact Scatter	5	0	0	0	Disturbed by trail	Low
FhNe 034	Overburden Storage	Artifact Scatter	9	1	12	1 Late Side-notched point	Disturbed by road	Moderate
FhNe 036	Overburden Storage	Artifact Scatter	19	5	69	0	Undisturbed	High
FhNe 044	Overburden Storage	Artifact Scatter	5	1	1 SRC debitage	0	Undisturbed	Low
FhNe 045	Overburden Storage	Artifact Scatter	10	3	12 debitage	0	Undisturbed	Moderate
FhNe 046	Overburden	Artifact Scatter	10	3	1 scraper, 26 debitage	0	Undisturbed	Moderate

	Storage							
FhNe 047	Star Open Pit	Artifact Scatter	0	0	0	0	Disturbed by drill pad	Low
FhNe 049/104	Star Open Pit	Artifact Scatter	11	1	32 debitage	0	Disturbed by trail	Moderate
FhNe 050	Star Open Pit	Artifact Scatter	13	0	0	0	Disturbed by road	Low
FhNe 053	Star Open Pit	Artifact Scatter	9	0	0	0	Disturbed by road	Low
FhNe 057	Orion South	Artifact Scatter	21	0	0	0	Disturbed by sand quarry	Low
FhNe 058	Orion South	Artifact Find	14	0	0	0	Disturbed by trail	Low
FhNe 059	Orion South	Artifact Find	18	0	0	0	Disturbed by drill pad	Low
FhNe 064	Duke Ravine Reservoir	Artifact Find	15	1	1	0	Undisturbed	Low
FhNe 065	Duke Ravine Reservoir	Artifact Find	11	0	0	0	Undisturbed	Low
Fhne 073	Star Open Pit	Artifact Find	4	0	0	0	Disturbed by road	Low
FhNe 074	Overburden Storage	Artifact Scatter	8	2	126 debitage	0	Undisturbed	Moderate
FhNe 075	Overburden Storage	Artifact Find	4	0	0	0	Undisturbed	Low
FhNe 076	Overburden Storage	Artifact Find	4	1	1 debitage	0	Undisturbed	Low
FhNe 077	Overburden Storage	Artifact Scatter	5	2	9 debitage	0	Undisturbed	Moderate
FhNe 078	Overburden Storage	Precontact/Historic Scatter	2	1	modern scatter	20th Century refuse	Disturbed by trail	Low
FhNe 079	Overburden Storage	Artifact Find	11	2	2 SRC debitage	0	Undisturbed	Low
FhNe 080	Overburden Storage	Artifact Find	6	1	3 SRC debitage	0	Undisturbed	Low
FhNe 081	Overburden Storage	Artifact Find	7	0	0	0	Undisturbed	Low
FhNe 082	Overburden Storage	Artifact Scatter	18	2	62 debitage, 1940s Dodge truck	0	Undisturbed	Moderate
FhNe 083	Overburden Storage	Artifact Find	5	0	0	0	Disturbed by trail	Low
FhNe 086	Star Open Pit	Artifact Scatter	23 m^2		1 point, 6 scrapers, 5 misc. tools, >12,000 debitage	Hanna Point	Disturbed by drill pad	Low
FhNe 087	Star Open Pit	Artifact Scatter	6	0	1 end scraper, 11 debitage, 1 FCR	Pelican Lake	Disturbed by trail/drill pad	High
FhNe 088	Star Open Pit	Artifact/Feature	23 tests;		2,200 artifacts - 2 points,	Besant, Pelican Lake,	Partially disturbed by trail	High

			4 m^2		end scraper, 1,559 FCR, >600 debitage	Hanna		
FhNe 089	Star Open Pit	Artifact Scatter	7	0	0	0	Disturbed by road	Low
FhNe 090	Star Open Pit	Artifact Scatter	14 tests	7	1 point, 1 preform, 1 biface, 1 end scraper, 512 debitage, 8 FCR, 1 core	Hanna	Disturbed by trail/drill pad	High
FhNe 091	Star Open Pit	Artifact/Feature	12 m^2 excavated; also tests		932 artifacts - debitage, cores, FCR, hammer stones, calc bone, 340 BP from charcoal	0	Disturbed by drill pad	High
FhNe 092	Orion South	Historic	7	0	0	Modern Refuse	Disturbed by road	Low
FhNe 093	Star Open Pit	Artifact Scatter	40	0	0	0	Disturbed by drill pad	Low
FhNe 094	Star Open Pit	Artifact Scatter	0	0		0	Disturbed by drill pad	Low
FhNe 095	Star Open Pit	Artifact Scatter	22	2	3 SRC debitage; 1 retouch flake	0	Disturbed by drill pad	Low
FhNe 096	Star Open Pit	Artifact Scatter	0	0		0	Disturbed by drill pad	Low
FhNe 097	Star Open Pit	Artifact Scatter	0	0		0	Disturbed by drill pad	Low
FhNe 098	Star Open Pit	Artifact Scatter	32	4	63 SRC debitage	Early Side-notched	Partially disturbed by drill pad	High
FhNe 099	Star Open Pit	Artifact Find	12	1	1 quartz debitage	0	Disturbed by forestry trail	Low
FhNe 102	Star Open Pit	Artifact Scatter	35	3	4 SRC debitage	0	Disturbed by drill pad	Moderate
FhNe 103	Star Open Pit	Artifact Find	0	0	0	0	Disturbed by drill pad	Low
FhNe 105	Star Open Pit	Artifact Find	18	0	0	0	Disturbed by road	Low
FhNe 110	Star Open Pit	Artifact Find	56	0	0	0	Disturbed by drill pad	Low
FhNe 111	Star Open Pit	Artifact Scatter	42	0	0	Hanna	Disturbed by drill pad	Low
FhNe 112	Star Open Pit	Artifact Scatter	32 tests; 2 m^2	0	76 debitage	0	Disturbed by drill pad	Low
FhNe 113	Star Open Pit	Artifact Scatter	28	0	0	0	Disturbed by drill pad	Low
FhNe 114	Star Open Pit	Artifact Scatter	38	0	0	Early Side-notched	Disturbed	Low
FhNe 115	Star Open Pit	Artifact Scatter	18		1 point, 92 debitage	McKean	Partially impacted by drill pad	High
FhNe 116	Star Open Pit	Artifact Scatter	44	1	2 SRC debitage	0	Disturbed by drill pad	Low
FhNe 117	Star Open Pit	Artifact Find	5	1	1 SRC debitage	0	Undisturbed	Low
FhNe 118	Star Open Pit	Artifact Find	55	0	0	0	Disturbed by drill pad	Low
FhNe 119	Star Open Pit	Artifact Scatter	32	1	7 SRC debitage	0	Disturbed by drill pad	Low
FhNe 120	Star Open Pit	Artifact Scatter	89	4	3 SRC, 1 quartzite core,	0	Partially disturbed by	Moderate

					1 FCR		drill pad	
FhNe 124	Star Open Pit	Artifact Scatter	16	0	0	0	Disturbed by drill pad	Low
FhNe 126	Plant	Artifact Scatter	16	2	2 end scraper; 2 SRC debitage	0	Partially disturbed by road	Moderate
FhNe 131	Orion South	Artifact Find	4	0	0	0	Disturbed by road	Low
FhNe 132	Star Open Pit	Artifact Scatter	12	0	0	0	Disturbed by drill pad	Low
FhNe 135	Star Open Pit	Artifact Scatter	13	7	54 SRC debitage	0	Undisturbed	Moderate
FhNe 136	Star Open Pit	Artifact Scatter	6	2	7 SRC debitage	0	Disturbed by drill pad	Low
FhNe 137	Star Open Pit	Artifact Find	8	2	2 SRC debitage	0	Undisturbed	Low
FhNe 138	Overburden Storage	Artifact Scatter	7	3	9 SRC debitage	0	Undisturbed	Moderate
FhNe 139	Overburden Storage	Artifact Scatter	20	1	3 SRC debitage	0	Disturbed by trail	Low
FhNe 141	Star Open Pit	Artifact Find	8	0	0	0	Disturbed by road	Low
FhNe 142	Star Open Pit	Artifact Find	4	0	0	0	Disturbed by road	Low
FhNe 143	Overburden Storage	Artifact Scatter	9	1	88 SRC debitage	0	Undisturbed	Moderate
FhNe 144	Star Open Pit	Artifact Find	17	2	2 SRC debitage	0	Disturbed by drill pad	Low
FhNe 145	Star Open Pit	Artifact Find	5	0	0	Avonlea Point	Disturbed by road	Low
FhNe 146	Star Open Pit	Artifact Find	6	2	1 SRC biface	0	Undisturbed	Low
FhNe 147	Star Open Pit	Artifact Find	4	1	1 SRC debitage	0	Undisturbed	Low
FhNe 148	Star Open Pit	Artifact Find	10	0	0	0	Disturbed by drill pad	Low
FhNe 149	Star Open Pit	Artifact Scatter	16	0	0	0	Disturbed by drill pad	Low
FhNe 150	Star Open Pit	Artifact Find	5	1	1 SRC debitage		Undisturbed	Low
FhNe 151	Star Open Pit	Artifact Find	5	1	1 SRC debitage	0	Undisturbed	Low
FhNe 152	PKCF	Artifact Find	7	0	0	0	Disturbed by forestry trail	Low
FhNe 153	Star Open Pit	Artifact Find	14	1	2 quartz debitage	0	Disturbed by drill pad	Low
FhNe 154	Star Open Pit	Artifact Find	12	0	0	0	Disturbed by drill pad	Low
FhNe 155	Star Open Pit	Artifact Scatter	22	1	1 SRC debitage	0	Partially disturbed by road	Moderate
FhNe 156	PKCF	Artifact Find	8	1	1 SRC core	0	Undisturbed	Low
FhNe 157	CPKS	Artifact Find	7	0	0	0	Undisturbed	Low
FhNe 159	Overburden Storage	Artifact Find	9	0	0	0	Undisturbed	Low
FhNe 160	Overburden Storage	Artifact Scatter	16	2 (in overburden	11	0	Undisturbed	Low

				from trail)				
FhNe 161	Overburden Storage	Artifact Find	8	1	1	0	Undisturbed	Low
FhNe 162	CPKS	Artifact Find	8	0	0	0	Undisturbed	Low
FhNe 163	Duke Ravine Reservoir	Artifact Find	8	0	0	0	Disturbed by road	Low
FhNe 164	Overburden Storage	Artifact Find	8	0	0	0	Disturbed by road	Low
FhNe 165	Overburden Storage	Artifact Find	8	0	0	0	Disturbed by road	Low
FhNf 050	Overburden Storage	Artifact Find	13	1	4	0	Disturbed by forestry trail	Low
FhNf 059	Overburden Storage	Artifact Scatter	15	3	9	0	Undisturbed	High
FhNf 062	Overburden Storage	Artifact Find	5	0	0	0	Disturbed by trail	Low
FhNf 063	Overburden Storage	Artifact Scatter	8	1	4 SRC debitage	0	Undisturbed	Low
FhNf 064	Overburden Storage	Artifact Scatter	9	0	0	0	Undisturbed	Low

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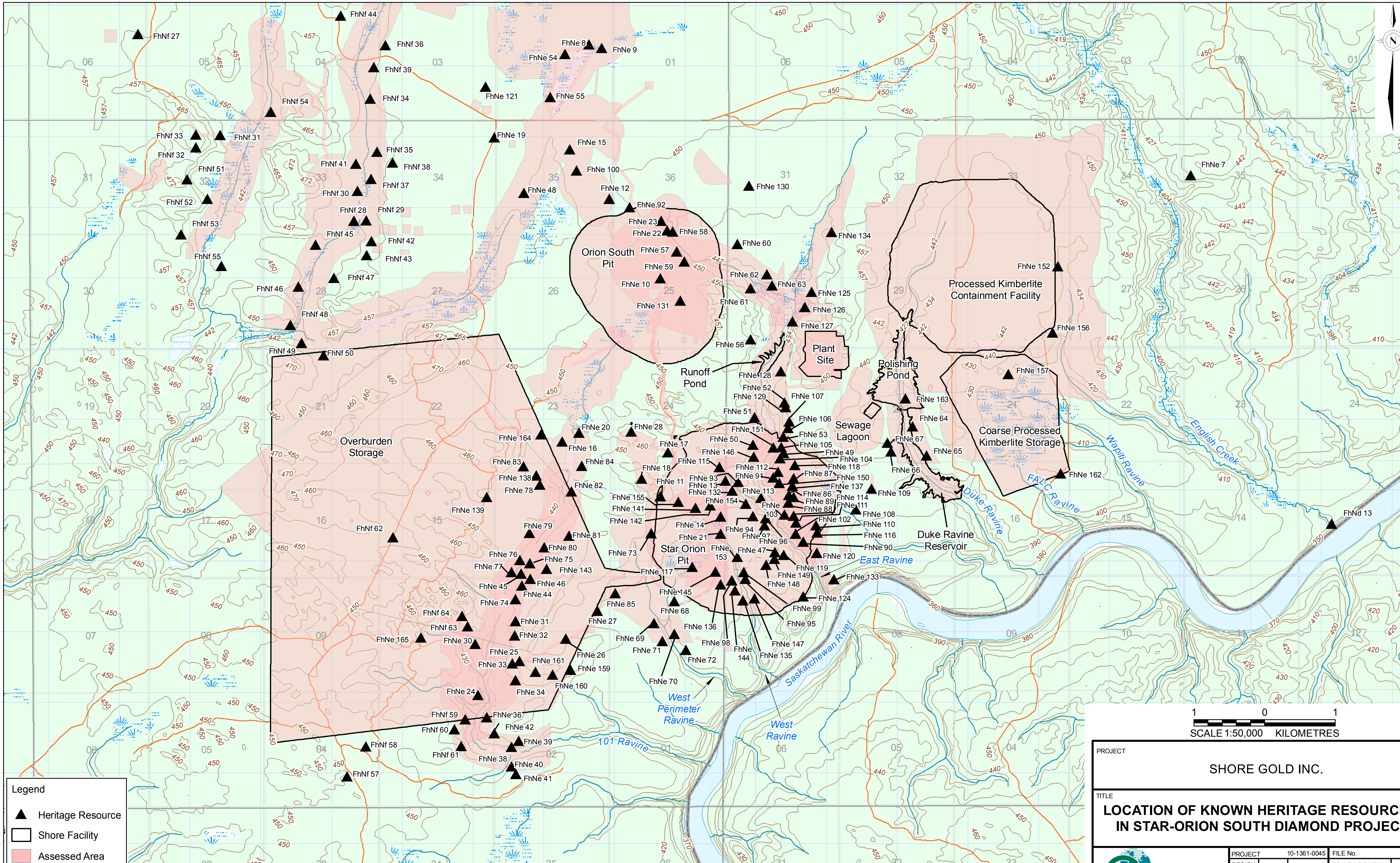

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PROJECT

SHORE GOLD INC.

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Golder Associates
Saskatoon, Saskatchewan

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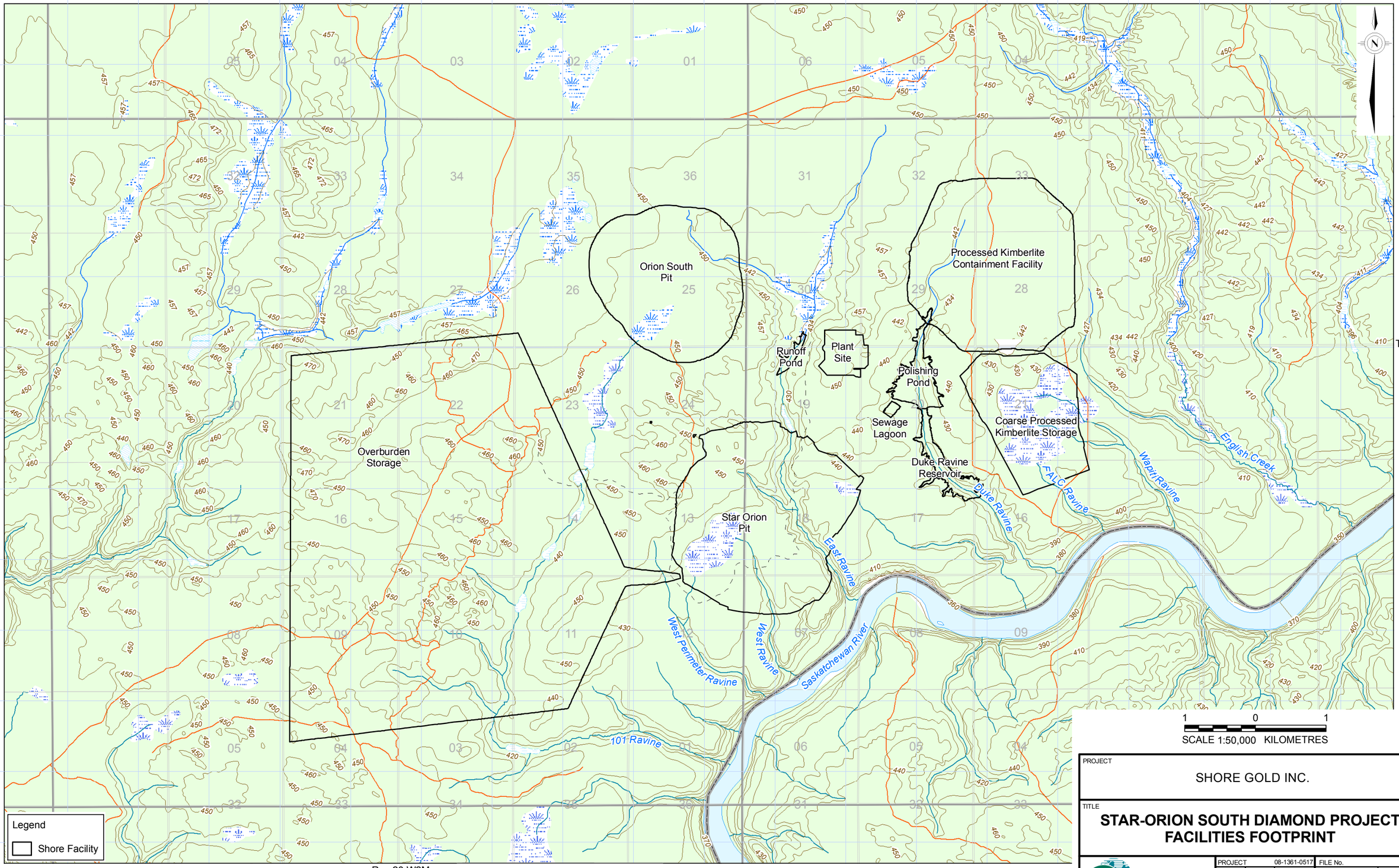

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SHORE GOLD INC.

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Golder Associates
Saskatoon, Saskatchewan

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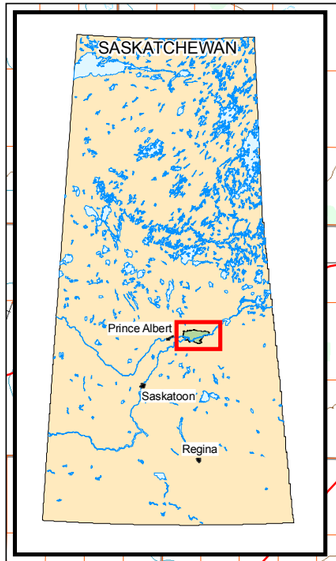

Meath Park
Weirdale
Smeaton
Choiceland
Fort à la Corne Provincial Forest
PRINCE ALBERT
North Saskatchewan River
South Saskatchewan River
Saskatchewan River
James Smith I.R. 100
Cumberland I.R. 100A
Muskoday First Nation I.R. 99
Weldon
Birch Hills

Twp 52
Twp 51
Twp 50
Twp 49
Twp 48

Rge 25 W2M
Rge 24 W2M
Rge 23 W2M
Rge 22 W2M
Rge 21 W2M
Rge 20 W2M
Rge 19 W2M
Rge 18 W2M

Legend
- Shore Facility
- Indian Reserve

Reference:
Mapsheet 73H
NAD 83 UTM Zone 13 (Grid North)

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SCALE 1:250,000 KILOMETRES

PROJECT
SHORE GOLD INC.

TITLE
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Golder Associates
Saskatoon, Saskatchewan

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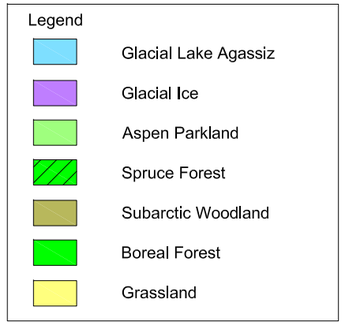

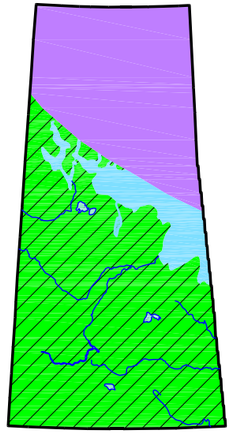
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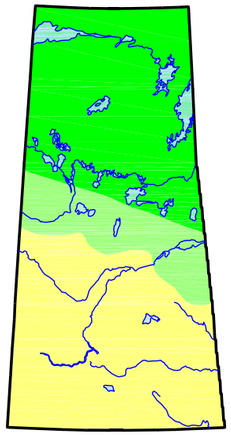
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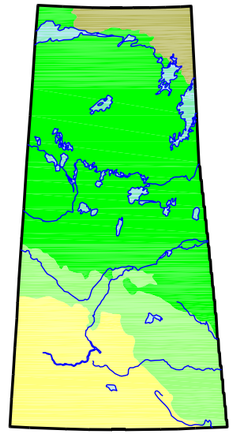
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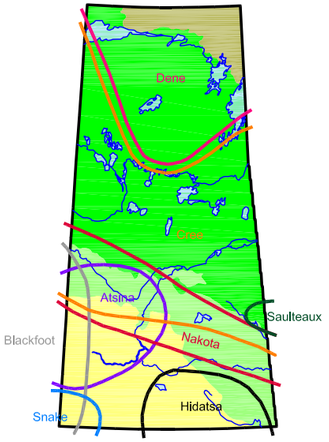
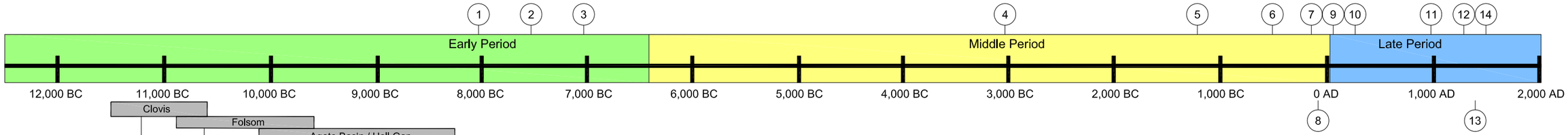
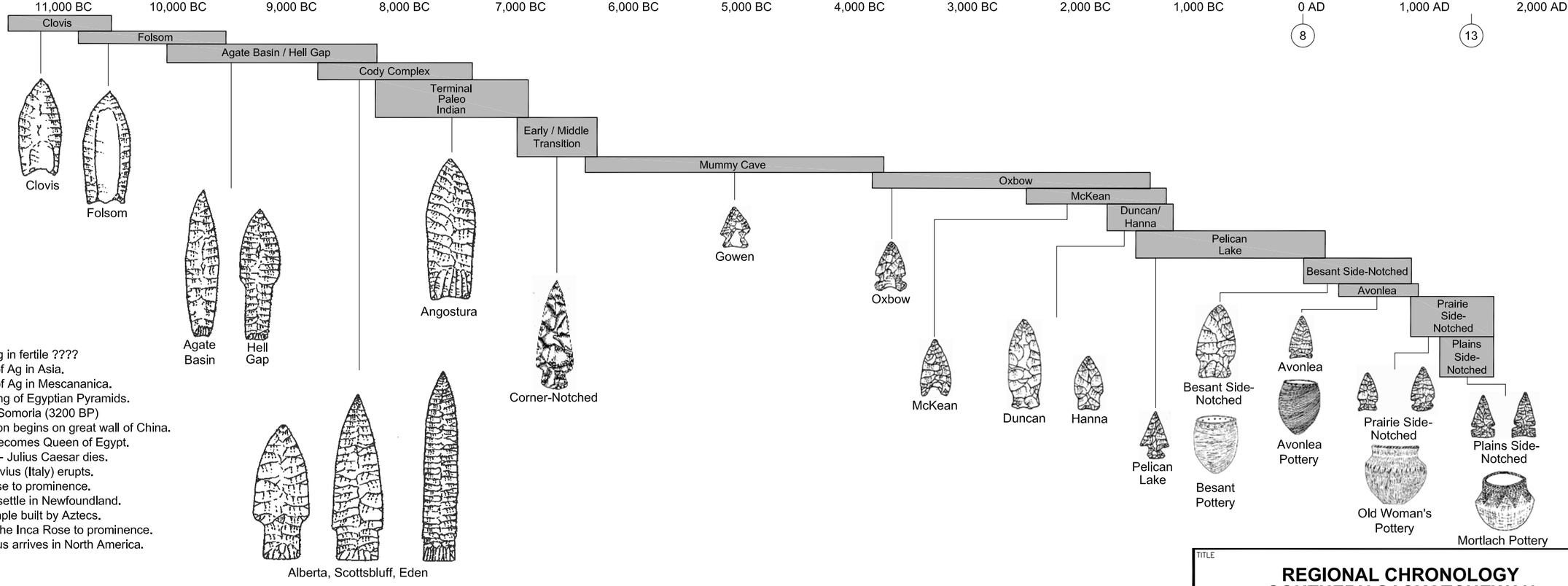


AD 1750





1. 8000 BC - Rise of Ag in fertile ????
2. 7500 BC (±) - Rise of Ag in Asia.
3. 7000 BC (±) - Rise of Ag in Mescananica.
4. 3000 BC (±) - Building of Egyptian Pyramids.
5. Origins of writing in Somoria (3200 BP)
6. 770 BC - Construction begins on great wall of China.
7. 51 BC - Cleopatra becomes Queen of Egypt.
8. 44 BC (March 15th) - Julius Caesar dies.
9. 79 AD - Mount Vesuvius (Italy) erupts.
10. 250 AD - Maya Rose to prominence.
11. 1000 AD - Vikings settle in Newfoundland.
12. 1325 AD - First temple built by Aztecs.
13. 1438 - 1532 AD - The Inca Rose to prominence.
14. 1492 AD - Columbus arrives in North America.

Note:
All dates calibrated to calendar years.

0 20 40mm
Projectile Point Scale

TITLE
REGIONAL CHRONOLOGY SOUTHERN SASKATCHEWAN

Golder Associates
Saskatoon, Saskatchewan

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CHECK	PY	19/10/10		
REVIEW	BN	19/10/10		

FIGURE: 3

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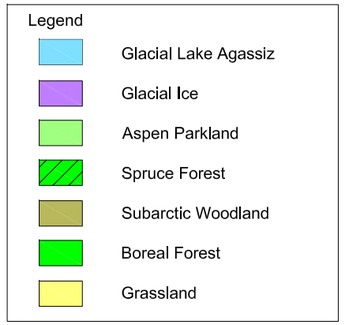

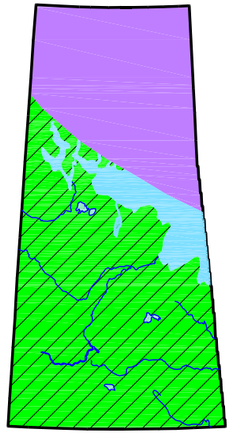
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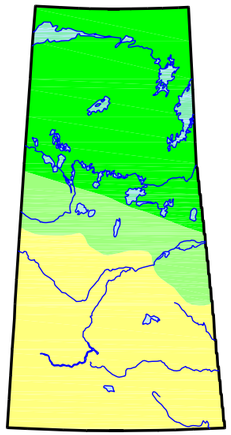
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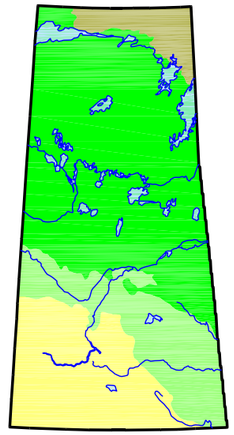
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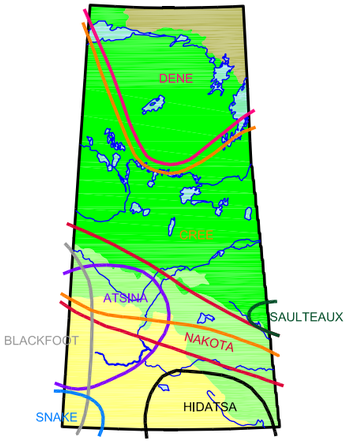
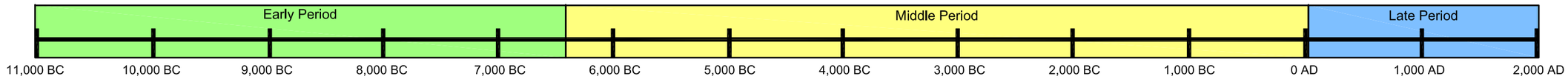
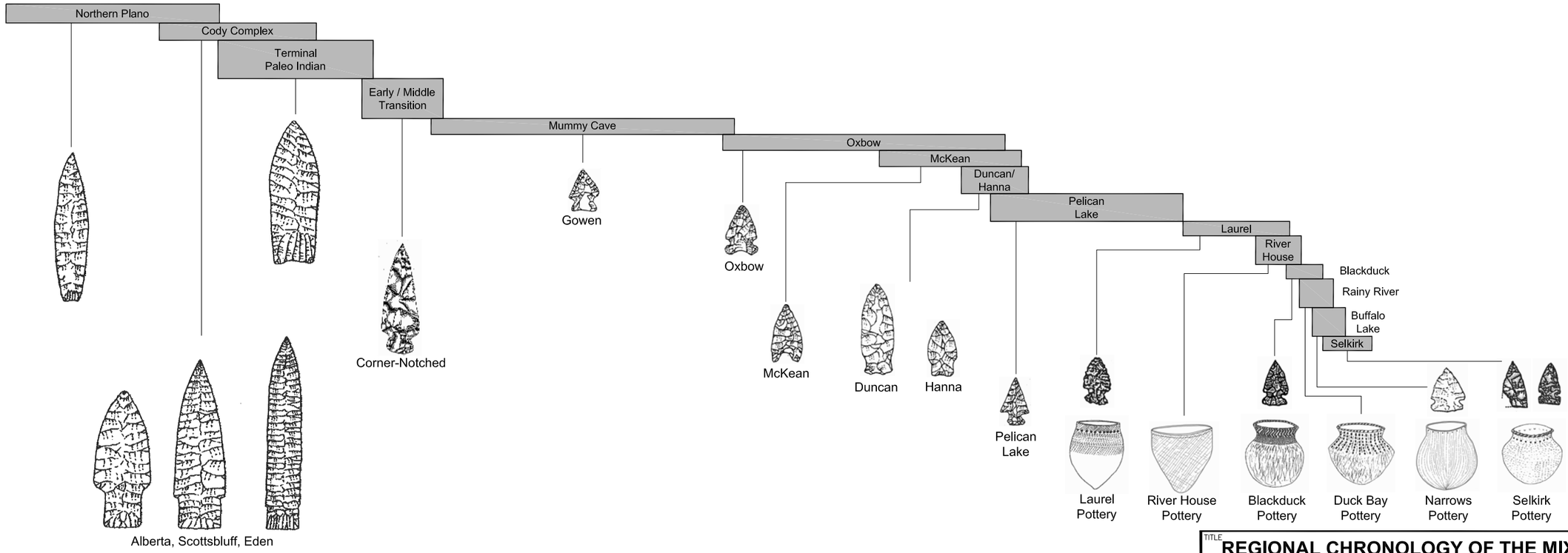


AD 1750





Note:
All dates calibrated to calendar years.

0 20 40mm
Projectile Point Scale

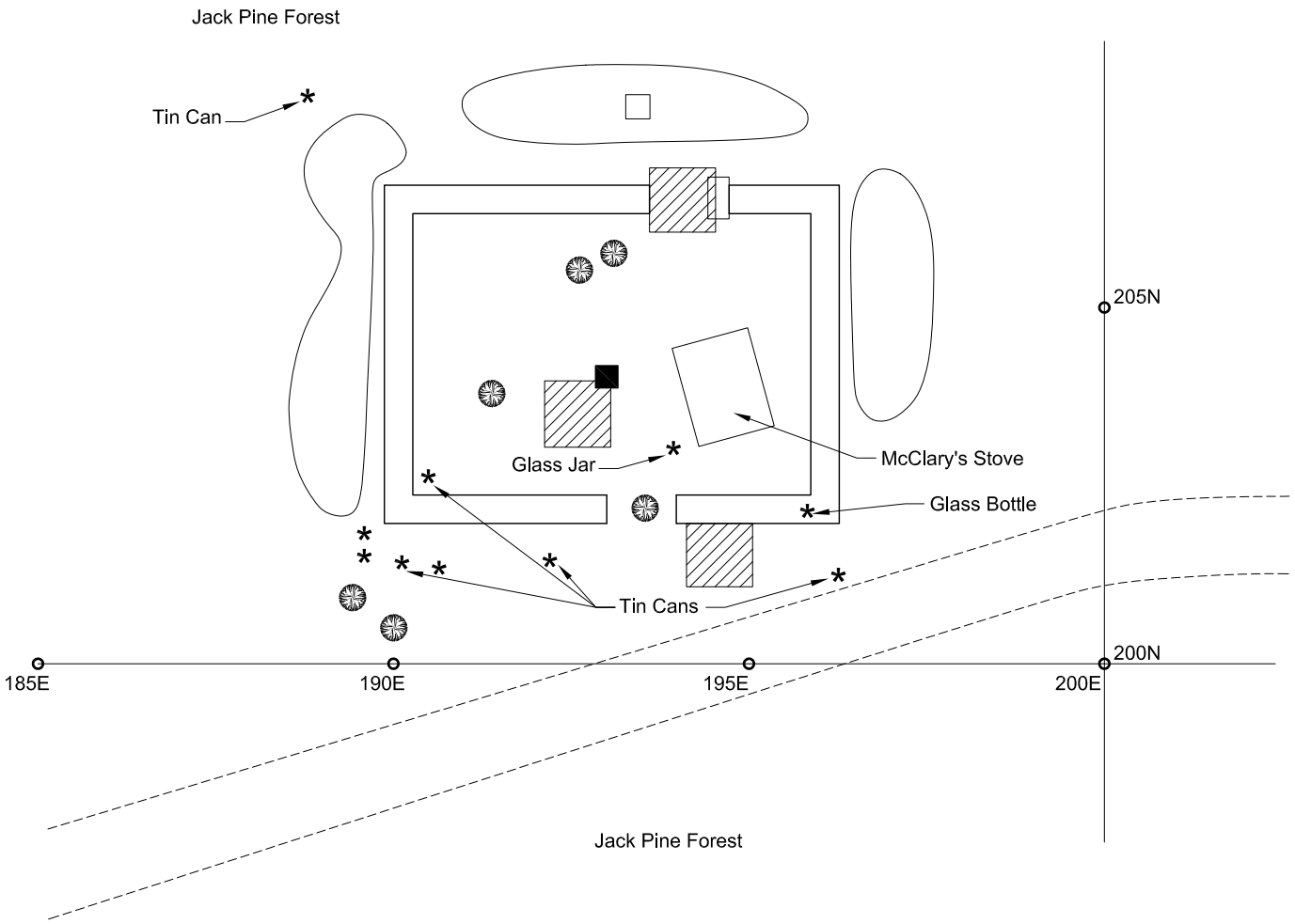
TITLE
REGIONAL CHRONOLOGY OF THE MIXED WOOD BOREAL FOREST OF NORTHERN SASKATCHEWAN

Golder Associates
Saskatoon, Saskatchewan

PROJECT No. 10-1361-0045			FILE No.		
DESIGN			SCALE	NTS	REV. 0
CADD	AKG	19/10/10			
CHECK	PY	19/10/10			
REVIEW	BN	19/10/10			

FIGURE: 4

G:\2010\1361\10-1361-0045 Shore Gold Heritage\CAD\ Drawing file: 10-1361-0045 - SASK CHRONO NORTH-BC.DWG Nov 10, 2010 - 2:40pm



2 0 2
SCALE 1:100 METRES

Legend
- Trail
- Positive Shovel Test
- Negative Shovel Test
- Artifact
- Trees
- Excavation Unit
- Cabin Outline (mound)
- Depression

PROJECT
KENSINGTON RESOURCES
HRIA

TITLE
SKETCH MAP OF CABIN FEATURE FROM FhNe 12

Golder Associates
Saskatoon, Saskatchewan

PROJECT	08-1361-0532		FILE No.	
DESIGN			SCALE AS SHOWN	REV. 0
CADD	AJL	04/03/09	**APPENDIX: A1**	
CHECK	PY	06/03/09		
REVIEW	BN	06/03/09		

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