



Northern Defence Radar Station

Cold Lake

Other Names: Cold Lake Northern Defence Radar Site
Cold Lake Radar Facility

Statement of Significance

Description of Historic Place

The Northern Defence Radar Station is a former military complex located on a cleared hilltop in a forested area. There are five major buildings connected by a long covered walkway, which are all enclosed within a fenced compound. A small gatehouse stands next to the main gates and a small pumping station is located outside the compound. All of the buildings have a distinctly utilitarian appearance with either cinder block or corrugated metal exterior walls and minimal fenestration. The Northern Defence Radar Station occupies roughly four hectares within the Municipal District of Bonnyville, adjacent to the City of Cold Lake and near Canadian Forces Base Cold Lake.

Heritage Value

The heritage value of the Northern Defence Radar Station lies in its association with Alberta's role in North America's Cold War defensive strategy.

The successful 1949 detonation of an atomic bomb by the Soviet Union and that nation's worsening relations with the western world resulted in the establishment of defensive radar installations across Canada. At that time, the largest perceived threat from the Soviets was assumed to be from long-range bomber aircraft flying over the Arctic Ocean and across Canada. Consequently, new radar construction was to concentrate on these northern regions. The Canadian and American governments jointly constructed and operated a series of 33 radar stations across Canada. Dubbed the PINETREE Line, these stations began operating in 1952 with new sites being built into the early 1960s. Three stations were located in Alberta. The Beaverlodge site became operational in 1953, the Cold Lake Station followed in 1954 and one near Penhold opened in 1964. An additional radar station, part of the Mid-Canada Line, was built at Stoney Mountain just south of Fort McMurray and opened in 1957.

The Cold Lake radar station was not originally part of the PINETREE Line. It was established to provide support to fighter aircraft operating out of the Royal Canadian Air Force training base, which had opened in 1954. The Cold Lake Radar Station, located approximately seven kilometres northeast of the air base, opened in August 1954. It was a manually operated station requiring operators to read and interpret the incoming signals. From 1956 to 1963, a fighter control school, which delivered specialized training for military radar operators, operated out of the station. In 1963, the station became fully integrated into the North American Air Defence (NORAD) System. The training school closed and the radar equipment was upgraded with new Semi-Automated Ground Environment (SAGE) radar equipment, which used computers to read and interpret most signals. At this point, the station began operating 24-hours a day. The training school was re-established in the 1970s as part of the MAPLE FLAG operation, which is a Canadian-led international combat training exercise.

Eventually ten buildings were built at the site: a guard house, water pumping house, three radome towers with spherical fibreglass domes, and five large operational and storage buildings. The radome towers and the larger buildings were connected by an enclosed metal walkway, which protected staff from inclement weather as they travelled around the site. The design and construction of these buildings represent the military mindset of function over form. The buildings were mostly prefabricated and were simple yet solid structures. Metal and concrete were the main materials used for structural components and the exterior walls were clad in modular construction panelling while most of the interior walls were covered with metal panels. There was minimal fenestration and very little decoration or ornamentation, emphasizing the utilitarian nature of the site.

Over the 1960s and 1970s, Cold War strategy changed and eventually focused on long-range missiles, rather than bomber aircraft, resulting in a reassessment of the role played by radar installations. Many of the older PINETREE stations were decommissioned through the 1980s. The Cold Lake station survived due to its training role and long-range radar capabilities.

However, by the early 1990s, the equipment at Cold Lake was considered to be antiquated and a new station with wider range and accuracy was established near Primrose Lake in Saskatchewan. In 1992, the Cold Lake Station was decommissioned, the three radomes and towers were removed and the site was closed.

Source: Alberta Culture and Community Spirit, Historic Resources Management Branch (File: Des. 2268)

Character-Defining Elements

Key elements that define the heritage value of the Northern Defence Radar Station include such elements as its:

General Characteristics:

- linear arrangement of the site's buildings along the top of a hill;
- curving access roadway following the contours of the hillside;
- utilitarian form of buildings;
- minimal fenestration on all buildings;
- corrugated metal panels on walls and ceilings;
- tempered steel girders and other supporting structures, some of which bear markings of the Algoma Steel Corporation;
- white painted exteriors with doors, support columns and other trim painted light blue;
- chain-link fence with barbed wire surrounding the compound.

Building 200 - Radar Command Centre:

- two-storey design and flat, built-up roof;
- poured cement foundation and partial basement;
- exterior walls clad in metal panels;
- metal entry doors with metal frames, two on both the east and west elevations;
- metal-framed window at the extreme east corner of the north elevation;
- outdoor, second floor viewing deck on the west elevation (facing the nearby air base);
- flagpole by the main entry door on the west elevation;
- steel column and beam structural framework;
- interior walls clad in metal panels, painted concrete and gypsum board;
- soundproof perforated interior partitions and walls;
- perforated metal drop ceilings;
- floors of painted concrete, vinyl tiles and asbestos tiles;
- extant original light fixtures.

Building 202 - Base Operations Centre:

- single-storey layout and wood truss supported gable roof with asphalt shingles erected over the original flat, corrugated steel deck panel roof;
- steel column and beam structural framework;
- poured concrete foundation and painted concrete floors;
- exterior walls clad in corrugated steel panels;
- interior walls clad in metal panels and gypsum board;
- painted, exposed rafter ceiling in portions of the building and acoustic drop ceiling in others;
- metal exterior doors and metal window and door frames.

Building 203 - Telecommunications Centre:

- single-storey layout and wood-truss supported gable roof erected over the original flat roof;
- exterior walls clad in corrugated steel;
- steel column and beam structural framework;
- poured concrete foundation and painted concrete floors;
- exterior walls clad in pre-fabricated panels;
- interior walls clad in metal panels and gypsum board;
- painted, exposed rafter ceiling;
- metal exterior doors, and metal window and door frames.

Building 207 - Power Plant:

- single-storey layout;
- steel frame;
- concrete slab foundation;
- concrete masonry block addition on the west side;
- exterior walls clad in asbestos millboard and corrugated steel panels;
- interior walls clad in metal panels;
- aluminum window frames;
- metal exterior doors;
- metal exhaust vents and double access doors on the north elevation;
- painted concrete floors in the generator room and vinyl floor tiles in other rooms;
- interior walls of small workrooms and washrooms clad in gypsum wall board.

Building 208 - Digital Data Converter Building:

- insulated concrete block structure;
- original clear-span steel joist roof structure;
- poured concrete foundation;
- metal door frames and exterior doors.

Covered Walkway:

- approximate 225 metre length;
- relationship to the five major buildings;
- shed roof sloping to the south side;
- exposed corrugated metal sheeting on roof and walls;
- exposed metal frame supporting structure;
- asphalt on corrugated metal panel floor.

Guard Hut/Gatehouse:

- flat, cantilevered roof with copper flashing;
- relationship with the chain-link fence surrounding the compound;
- exterior walls clad in asbestos millboard.

Pumphouse:

- location slightly downhill and to the south of the main compound;
- single-storey form and flat roof;
- exterior walls clad in asbestos millboard;
- chain-link fence with barbed wire surrounding the building.

Location

Street Address:

Community: Cold Lake
 Boundaries: Legal Subdivisions 8 and 9 in 11-63-2-W4 and Legal Subdivisions 5 and 12 in 12-63-2-W4
 Contributing Resources: Buildings: 7
 Structures: 2

ATS Legal Description:

Mer	Rge	Twp	Sec	LSD
4	2	63	11	05
4	2	63	11	08
4	2	63	11	09
4	2	63	12	12

PBL Legal Description (Cadastral Reference):

Plan	Block	Lot	Parcel
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Latitude/Longitude:

Latitude	Longitude	CDT	Datum Type
54.434859	-110.181633	Secondary Source	NAD83

UTM Reference:

Northing	Easting	Zone	CDT	Datum Type
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Recognition

Recognition Authority: Province of Alberta
 Designation Status: Provincial Historic Resource
 Date of Designation: 2010/06/15

Historical Information

Built: 1954 to 1954
Significant Date(s)
Theme(s) Governing Canada : Military and Defence
Historic Function(s):
Current Function(s):
Architect:
Builder:
Context:

With the explosion of an atomic bomb by the Soviet Union in 1949, the Cold War between the Soviets and NATO powers immediately gained a new perspective, especially for people in Canada. With the Soviets' further development of long-range bombers, war could now mean the possibility of air strikes across the Arctic Ocean, with nuclear weapons aimed at North American cities. Both the American and Canadian governments began to consider the erection of a series of early warning radar bases to detect any hostile aircraft from the north. The result was 33 Pinetree line radar bases from Vancouver to Labrador, 11 of which were to be financed and manned by Canada. These were completed in 1954 at a cost of \$450 million. The Pinetree line bases were supplemented by a mid Canada line of bases further south, and, in the mid-late 1950's by a series of DEW (distant early warning) line bases further north.

Among the Pinetree radar bases was one at Cold Lake, where a Canadian Army training base had been established during World War II. Following the war, the base continued in operation as a military testing range and a training base for jet pilots. It was, therefore, a logical site for a radar base. The base, which was fully operational by the spring of 1954, consisted of seven structures, most built of lightly tempered steel. They were all inter-connected by an exterior hallway. Two of the buildings, and the top part of a third, featured rounded hemispheric domes, through which radar beams could search the skies. The complex added much to the economy of the new community of Cold Lake, which was incorporated as a village in December 1953, and as a town in July 1955. Military personnel at the site participated in many community activities, including sporting events, frequently staging parades.

The Northern Defense base at Cold Lake continued to be operated by 42 Squadron of the Canadian Air Force (and, later, the unified Canadian Forces) until 1993, when the Squadron was demobilized. The radar operation itself had ceased functioning many years earlier as the Cold War had come to an end. The buildings themselves were now used as part of the overall Canadian Forces air training program. With this development, the three radar domes had been dismantled. In 1995, the site was purchased by the new City of Cold Lake, which, in 1997, turned it over to the Cold Lake Museum Society which developed it into a museum to house Aboriginal, Gas and Oil, and Aviation history, and other themes.

The historical significance of the Northern Defense Radar Buildings at Cold Lake lies in their provision of structural evidence of the Cold War in western Canada, and how the country had prepared itself to detect, if not thwart, an air invasion of the continent over the Arctic Ocean.

Additional Information

Object Number: 4665-1358
Designation File: DES 2268
Related Listing(s):
Heritage Survey File:
Website Link:
Data Source: Alberta Culture and Community Spirit, Historic Resources Management Branch, Old St. Stephen's College, 8820 - 112 Street, Edmonton, AB T6G 2P8 (File: Des. 2268)