

LIBERTY UNIVERSITY

THE IMPORTANCE OF BEING ANCILLARY:
THE COLD WAR CONTEXT OF FORT GREELY, ALASKA

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Introduction

Summer in Alaska has another name to locals: road construction. Between the widespread construction zones that can keep traffic halted for up to thirty minutes at a time and the hundreds of massive RVs that creep along the scenic highways oblivious to the dozens of cars inching along behind waiting, frustrated, for an opportunity to pass, road trips during Alaska's tourist season are a chancy proposition. For an unwilling participant in one of these summer convoys, heading north on the Richardson Highway as it approaches the junction with the Alaska Highway that gives the town of Delta Junction its name, it would be easy to miss the low brown sign that is the only indicator of the presence of Fort Greely. A driver could be distracted by the Delta River on the other side of the road as it meanders through its many channels on its way to meet the Tanana River a few miles ahead, or by the stunning vista of the Alaska Range, dominated by the triple peak of Mt. Hayes, that commands the horizon in the rear-view mirror. But behind the low screen of spruce and birch trees that blocks the fort from the eyes of passing motorists lies an Army base that has been highly significant to American defense.

The tourists that clog Alaskan roads and the oil pipeline that crosses Fort Greely's land now dominate the economy of the 49th state, but for many decades, the military provided both the majority of Alaskan economic development and its relevance to the national spotlight. Fort Greely, incubated in World War II and birthed alongside the Cold War, had its destiny and mission intertwined with an ideological struggle that brought millions of dollars and thousands of men to the Alaskan territory.¹ The end of that struggle, for a time, spelled the end of the

¹ John Whitehead, "Alaska and Hawai'i: The Cold War States," in *The Cold War American West, 1945-1989*, ed. by Kevin J. Fernlund, (Albuquerque, NM: University of New Mexico Press, 1998), 196-197.

military's reliance on Fort Greely, and for six years the base was nearly deserted and Fort Greely almost ceased to exist.

During that period of limbo, the Army financed an inventory and evaluation of the military structures at the base to consider their qualification for possible historical preservation under the National Historic Preservation Act of 1966.² The report presented paints a stark picture of historical insignificance for every building on the base, systematically considering and then dismissing any possible contributions the buildings or the events that took place around them might have played in national history. Considering the base's World War II era activities, the report concludes, "Nineteen of the 20 buildings [constructed during World War II] are ancillary facilities that did not have a major role in any historic events or technological developments of World War II. In addition, they are not associated with any historically significant persons, do not embody the distinctive characteristics of a type or method of construction, and are limited in their ability to yield data important to history."³

Considering the Cold War-era buildings, and by extension the Cold War contributions of the base, the report is even more succinct and seemingly definitive: "All are architecturally undistinguished ancillary facilities that did not have a major role in any historic events or technological developments of the Cold War."⁴ From these pronouncements comes the impression that Fort Greely played no important role in either conflict, and that a discussion of its history is a foregone conclusion. While no amazing architecture is to be found there, and few distinguished names ever found their way to Delta Junction, from a careful study of Alaska's

² Tetra Tech, Inc., "Inventory and Evaluation of Military Structures at Fort Greely, Delta Junction, Alaska," prepared for U.S. Army Corps of Engineers Alaska District (April 1999), 1-1.

³ Ibid., 3-10.

⁴ Ibid., 3-20.

Cold War history comes an understanding of a more subtle, yet still important role played by these “undistinguished ancillary facilities.”

The limited number of scholarly works dealing with Alaska’s history and role in the Cold War has lent credence to this view of Fort Greely, placing very little emphasis on the post. In Claus-M. Naske and Herman E. Slotnick’s general history of Alaska, Fort Greely merits only one brief mention, with no explanation of why it existed or the purpose it was to play in the Cold War.⁵ John Whitehead, in an essay on the importance of Alaska and Hawai’i as “Cold War states,” gives emphasis to Alaska’s critical role in American military strategy in the Cold War, but Fort Greely’s part in that again receives only the barest attention.⁶

Works that focus on the military in Alaska give significantly more discussion to Fort Greely, including the third volume of Lyman L. Woodman’s exhaustive history of the Army in Alaska. Woodman provides insights into different portions of the post’s history, but the somewhat disorganized nature of his work obscures Fort Greely’s overall purpose and contributions to the Cold War. An evaluation of Fort Greely’s status and significance as part of Alaska’s Cold War heritage by Army historian D. Colt Denfeld acknowledges the importance of several aspects of the fort’s history to the Cold War, but does not provide a complete picture of Fort Greely’s contributions.⁷

From the critical role played by the first military post established at what was then known as Big Delta in 1942 in the effort to provide desperately needed aircraft to the Soviet Union in World War II, to the Army’s first dedicated cold weather training and testing facilities

⁵ Claus-M. Naske and Herman E. Slotnick, *Alaska: A History of the 49th State*, 2nd ed. (Norman, OK: University of Oklahoma Press, 1987), 131.

⁶ Whitehead, “Alaska and Hawai’i,” 196.

⁷ D. Colt Denfeld, *The Cold War in Alaska: A Management Plan for Cultural Resources, 1994-1999* (US Army Corps of Engineers, Alaska District, 1994), 281, 286.

established soon after the war ended, to the ongoing mission of providing a theater for large-scale war games as Cold War tensions gripped the nation, to the significant advancements in Cold War science and technology that occurred within Greely's boundaries, Fort Greely was a site that was always shaped by U.S. relations with Alaska's former owner, Russia. Through its role in facilitating the transfer of Lend-Lease planes to Soviet pilots in World War II, providing a home to train both individual soldiers and entire battalions to fight and survive in the Arctic, and ensuring the progression of science and technology in a conflict that was driven by those forces, Fort Greely shows the incredible impact that can come from even the most ancillary and undistinguished group of buildings.

Chapter 1- World War II on the Last Frontier

Growing international tensions and the increased importance of air travel combined to ensure increased scrutiny of Alaska in the years leading up to World War II. As early as 1934, Anthony Dimond, Alaska's non-voting delegate to the House of Representatives, noted Alaska's crucial position astride the great circle route from the United States to Asia,¹ and warned Congress of the growing threat posed by Japan to the largely undefended territory.² In testimony before Congress on February 12, 1935, former Brigadier General William Mitchell supported Dimond, stating that Alaska was "the most important strategic place in the world."³ Gen. Mitchell, however was not voicing the opinion of many in Army circles, and a continued military conviction that Alaska was not strategically important led to Congressional apathy, and prevented any major military buildup in the territory until 1940, when serious military attention finally focused on Alaska.⁴

When considering possible military action in Alaska, military planners decided to focus on the creation of multiple, autonomous garrisons in the Aleutians and southern Alaska that could each repel an enemy attack. Planners realized, however, that this plan would only be feasible if there was a strong military aviation force available to support the ground forces.⁵ Therefore, General Simon B. Buckner, commander of Army troops in Alaska, advocated:

building advanced operating bases for bomber planes in western Alaska, including the Aleutian chain; constructing auxiliary fields near the existing main bases to prevent the

¹ Great circle routes are "the shortest course between two points on the surface of a sphere." Geometrically, they form a circle that includes the center of a sphere, thus splitting the sphere into two equal halves. *Encyclopædia Britannica Online*, s. v. "great circle route."

² Claus-M. Naske and Herman E. Slotnick, *Alaska: A History*, 3rd ed. (Norman, OK: University of Oklahoma Press, 2011), 176.

³ *Ibid.*, 177.

⁴ Stetson Conn, Rose C. Engelman, and Byron Fairchild, *Guarding the United States and Its Outposts* (Washington, DC: The Center for Military History, 1964), 224.

⁵ *Ibid.*, 227.

undue massing of aircraft with consequent danger from bombing attack; connecting the United States and Alaska by a chain of landing fields; developing intermediate bases to facilitate the movement of aircraft to and within the territory; establishing an aircraft warning service; and maintaining in the United States a reserve of both combat and transport aircraft equipped for cold weather flying for the prompt reinforcement of Alaska in an emergency.⁶

It was to provide for this that a feverish period of construction began on a series of airfields that became known as the Northwest route, which would enable aircraft to make the long and treacherous journey across Canada and Alaska to reach the military installations that were being constructed and expanded. In December 1940, the Civilian Aeronautics Authority (CAA) announced that work would begin on an airfield at Big Delta, a small community some eighty-five miles southeast of Fairbanks, which had grown around a ferry crossing on the Tanana River and would ultimately be the endpoint of the Alaska-Canada Military Highway that was built to follow the air route in 1942.⁷

The airfield at Big Delta, though initially a civilian project financed by the CAA, soon came under the aegis of the Army Corps of Engineers as war with Japan threatened.⁸ By the end of 1941, as the United States officially entered the war, two asphalt runways had been completed at the Big Delta airfield, making it one of the better prepared sites along the air transport route from Canada.⁹ Military preparations in Alaska received their first major test when, in June 1942, Japanese ground forces made their only incursion onto North American soil through an invasion of the islands of Attu and Kiska in the Aleutian chain. Though the Japanese never attempted to advance beyond those remote holdings, American forces subsequently spent the next year

⁶ Ibid., 240.

⁷ Blake W. Smith, *Warplanes to Alaska* (Blaine, WA: Hancock House Publishers, 1998), 39; and Naske and Slotnick, *Alaska: A History*, 182-183.

⁸ Lyman L. Woodman, *Duty Station Northwest: The U.S. Army in Alaska and Western Canada, 1867-1987, Volume Two-1918-1945* (Anchorage, AK: Alaska Historical Society, 1997), 144.

⁹ Ibid., 145; and Smith, *Warplanes to Alaska*, 39-40.

engaging in an intense bombing campaign that eventually culminated in the May 1943 American landing on Attu and the August invasion of Kiska.¹⁰

Though the campaign on Attu saw several weeks of intense fighting, it would not be in direct combat that Alaska would see perhaps its most important role in the war. Instead, it was through its unique position geographically in relation to the Soviet Union. Even before the Pearl Harbor attack, President Franklin Roosevelt had stretched the limits of the definition of neutrality by providing aid to Great Britain and France. In March 1941, Roosevelt signed the Lend-Lease Act, thereby permitting the United States to supply defense items to any country “whose defense he deemed necessary to the defense of the United States.”¹¹ Extending such aid to Britain was controversial enough to many American isolationists, but the idea that such aid might eventually go to the Soviet Union was unthinkable even for many who supported the aid to Britain.¹²

The Nazi-Soviet Pact, the Russo-Finnish War, and the Soviet annexation of the Baltic States, combined with an American mistrust of communism, seriously hampered U.S.-Soviet relations. However, only four days after the onslaught of Operation Barbarossa on June 22, 1941 solidified the Soviets as enemies of Germany, Soviet ambassador Konstantin Umansky approached Acting Secretary of State Sumner Welles regarding the possibility of material aid in their fight.¹³ Roosevelt soon declared his willingness to extend Lend-Lease aid to the Soviet Union.¹⁴ Problems plagued the early months of this new relationship, and the limitations of pre-

¹⁰ Naske and Slotnick, *Alaska: A History*, 178-186.

¹¹ Robert Huhn Jones, *The Roads to Russia: United States Lend-Lease to the Soviet Union* (Norman, OK: University of Oklahoma Press, 1969), 16.

¹² *Ibid.*

¹³ “Memorandum of Conversation by the Acting Secretary of State,” June 26, 1941, *Diplomatic Papers, Foreign Relations of the United States* [hereafter *FRUS*], 1941, *The Soviet Union* (Government Printing Office, 1958), 769-772.

¹⁴ Hubert P. van Tuyl, *Feeding the Bear: American Aid to the Soviet Union, 1941-1945* (New York: Greenwood Press, 1989), 3.

war footing American industry made it easier to promise aid than to actually deliver it. Any planes, guns, and tanks that would be delivered to the Soviets would have to come at the expense of America's own rearmament and commitments to Britain.¹⁵ Even once items had been manufactured, there remained the significant obstacle of transporting them to the Soviet Union.

Each of the three main sea routes presented enormous difficulty. The shortest route, from Iceland to the ports of Murmansk or Archangel, was the most dangerous, as Nazi naval and air forces in Norway constantly patrolled the frigid waters and sank dozens of transport ships on their way to or from the ports.¹⁶ Another option, the lengthy route around the Cape of Good Hope and up through the Persian Gulf to Iran, not only took significantly longer, but also was hampered by inadequate unloading and transportation infrastructure to remove supplies from the ships and move them across Iran to Russia.¹⁷ The journey across the Northern Pacific from the American West Coast to Siberian ports was less risky, but after Pearl Harbor, only Soviet vessels could make the voyage, and supplies still had to be transported the entire width of Russia before they could reach Soviet forces fighting the Germans.¹⁸

Especially difficult to transport via ship were the planes the devastated Soviet Air Force needed to combat the *Luftwaffe*. Shipped disassembled, the planes still had to be assembled before they could be used.¹⁹ As early as August 1941, Americans had proposed a solution to the problem of aircraft transport: flying the planes through Alaska and to airfields in Siberia, where

¹⁵ Jones, *The Roads to Russia*, 40-41.

¹⁶ *Ibid.*, 99-108; and "The Second Secretary of Embassy in the Soviet Union (Thompson) to the Secretary of State," May 7, 1942, *FRUS, 1942, Europe*, 701.

¹⁷ Jones, *The Roads to Russia*, 110; and "Memorandum by Mr. Addison E. Southard of the Division of Defense Materials to the Assistant Chief of the Division (Merchant)," December 15, 1942, *FRUS, 1942, Europe*, 752.

¹⁸ Jones, *The Roads to Russia*, 113.

¹⁹ Otis Hays, *The Alaska-Siberia Connection: The World War II Air Route* (College Station, TX: Texas A&M University Press, 1996), 24.

Soviet pilots would take over.²⁰ While the efficiency of this route was attractive to American planners, it also had the added attraction of gaining U.S. pilots access to and familiarity with Soviet air bases in Siberia, which could be useful against Japan.²¹ Such a possibility, however, was precisely what the Soviets most feared in regards to Lend-Lease activities. Suspicious of American motives, especially the suggestion that American pilots would gain entry to Siberia, and unwilling to take any action that could lead to the loss of the Soviet-Japanese Neutrality Pact, the Soviets rejected the entire idea of the Alaskan route, with Stalin declaring that it was “too dangerous a route” when U.S. special envoy Averill Harriman presented it to him in late September 1941.²²

The necessity of a more efficient delivery route, however, soon began to override instinctive Soviet paranoia, and by October the Soviets had begun to prepare the air bases across Siberia that would be required to make the Alaska-Siberia (ALSIB) air route a reality.²³ On June 8, 1942, Soviet ambassador Maxime Litvinov reported to Washington that the Kremlin had approved the ALSIB route. When Roosevelt communicated his hope to Stalin that the route would also lead to further U.S.-Soviet military cooperation in the Far East against Japan, including U.S. access to Siberian bases, Stalin’s reply made it clear that Soviet pilots would be the only ones making the journey from Alaska to Siberia.²⁴

Throughout the summer of 1942, while the Soviets scrambled to carve usable airfields out of the Siberian wilderness, the newly established Army Air Force Air Transport Command (ATC) faced the task of preparing the hastily constructed airfields of the Northwest route for the

²⁰ Jones, *The Roads to Russia*, 112.

²¹ Hays, *Alaska-Siberia Connection*, 22.

²² W. Averill Harriman and Elie Abel, *Special Envoy to Churchill and Stalin 1941-1946* (New York: Random House, 1975), 88.

²³ Hays, *Alaska-Siberia Connection*, 26.

²⁴ *Ibid.*, 28-29.

huge volume of traffic that the Lend-Lease shipments would necessitate.²⁵ The ATC's Ferrying Division had immediate responsibility for the airfields and "on June 26, Col. William Tunner of the ATC's Ferrying Division gave Lt. Col. Leroy P. de Arce, commander of the 7th Ferrying Group, his mission: 'You will take necessary action to organize and operate a ferrying route between Great Falls, Montana and Fairbanks, Alaska, through Lethbridge, Calgary, Edmonton, Fort St. John, Fort Nelson, Watson Lake and Whitehorse, Canada and through Northway and Big Delta, Alaska.'"²⁶

Big Delta would prove to be the last stop on the Northwest route before the planes reached the rendezvous with their new Soviet pilots at Ladd Field in Fairbanks. The May 1942 Japanese invasion of the Aleutians had ensured that the Big Delta Airfield was far from ready for its new, critical role in supporting the operation to aid the Soviet Union, but construction was soon under way for a new, 7,000 foot long runway to complement the two that had been built by the CAA the previous year.²⁷ June and July of 1942 brought the first garrison of troops to the airfield, with "a platoon of Company, E, 138th Infantry and Company C, 176th Engineers" taking up residence under the command of a Captain Anderson.²⁸

Though the airfield at Big Delta and other facilities in Alaska remained part of the Alaska Defense Command under the control of the Eleventh Air Force, in mid-August the 7th Ferrying Group commander Lt. Col. de Arce gave responsibility for the Big Delta Airfield and all other bases in the Alaskan sector of the Northwest route to the 384th Air Base Squadron under the

²⁵ Ibid., 34.

²⁶ Ibid.

²⁷ Ibid., 36; and Woodman, *Duty Station Northwest*, Vol. 2, 145.

²⁸ Woodman, *Duty Station Northwest*, Vol. 2, 145; and "Fort Greely Anniversary," *Delta Midnight Sun*, August 1970, 1.

command of Maj. F. Kitchigman.²⁹ A detachment from the 384th was sent to augment the garrison at the airfield and ensure that it was ready for the flow of aircraft that was anticipated. Almost as soon as the preparations had been made, however, word came from Washington that seemed to halt the entire project.

The first group of Lend-Lease aircraft, five A-20 light bombers, arrived at Ladd Field on September 3, having made the 1,900 mile trip from Great Falls, Montana in two days.³⁰ Nine more A-20s, thirty P-40 fighters, and six C-47 transports soon followed. Soviet crews arrived in Alaska to organize the transfers, and all seemed to be going smoothly when, on September 19, General Alexander Belyaev, head of the Soviet Purchasing Commission in Washington, announced that the Soviet government had come to the decision that the ALSIB route was not suitable.³¹ This startling reversal caused intense frustration in the American military administration, and the War Department halted all aircraft shipments to Alaska. For two weeks, uncertainty ruled, and the future of the Big Delta Airfield and the rest of the Northwest route no longer seemed assured.³²

When, on September 21, the War Department notified its representative in ALSIB negotiations in Moscow, Army Air Force Maj. Gen. Follett Bradley, that the ALSIB route would no longer be an option for Lend-Lease delivery, Bradley brought the issue to the Soviet's attention, and was surprised to find that Moscow had no knowledge of Belyaev's assertion.³³

²⁹ Smith, *Warplanes to Alaska*, 58.

³⁰ Hays, *The Alaska-Siberia Connection*, 39; and Blake W. Smith, "The Northwest Route to Alaska," in *Allies in Wartime: The Alaska-Siberia Airway during World War II*, ed. Alexander B. Dolitsky (Juneau, AK: Alaska-Siberia Research Center, 2007), 23.

³¹ "Telegram: The Secretary of State to the Ambassador in the Soviet Union (Standley)," Sept. 26, 1942, *FRUS, Europe, 1942*, 725.

³² *Ibid.*

³³ William H. Standley and Arthur A. Ageton, *Admiral Ambassador to Russia* (Chicago: Regnery, 1955), 255.

Bradley received word on October 4 that the Soviet “government had decided to keep the ALSIB air route open.”³⁴ The miscommunications continued, and on October 6, the “disgusted War Department” notified Bradley “that it now considered the ALSIB air route definitely and finally closed. When General Bradley passed this information on to his Soviet colleagues, the news produced a violent commotion.”³⁵ Bradley, at their request, asked the War Department to reassess that determination, notifying them that the Soviets were still in favor of the route, and wanted to operate ALSIB at full throttle.³⁶ Given the amount of planning and preparation that had already gone into the buildup of the Northwest route, the War Department relented, and Soviet pilots began preparations to ferry the planes that had already reached Alaska before the two week halt in the process.³⁷

For the Soviets that would remain in Fairbanks on a long-term basis, the language barrier and a lack of interpreters prevented any significant interactions with American personnel. Also contributing to their isolation were orders prohibiting fraternization, orders enforced by a fear of NKVD surveillance and punishment for perceived infractions.³⁸ An incident in mid-July 1943, in which two NKVD officers were involved in the disappearance of an American driver, inflamed tensions between Soviets and Americans, but when the driver’s body was found with no signs of foul play, suspicions eased, and a more normal relationship resumed.³⁹ The most notable area of cultural exchange was in the stores of Fairbanks, where both pilots and long-term staff took advantage of the wide variety of goods available to purchase luxury items for relatives and

³⁴ Ibid.

³⁵ Ibid.

³⁶ Ibid.

³⁷ Hays, *Alaska-Siberia Connection*, 45.

³⁸ Ibid., 72-73.

³⁹ Ibid., 80-84.

friends in Russia. Many of the aircraft that departed Alaska carried packages intended for loved ones as well as military equipment.⁴⁰

Once aircraft delivery had finally begun, new problems emerged to make meeting the proposed volume of 142 planes per month impossible.⁴¹ Given the late in the year starting date, winter weather conditions soon arrived to make things more difficult. The lengthy flight from Montana ensured that by the time planes reached Big Delta they would often need maintenance. Many of the airfields on the Northwest route had no hangar to allow mechanics to work indoors, thus forcing the technicians to do their work in the full onslaught of the elements, working in relays so that no man spent too long in the cold. In 1942, the construction of a large Birchwood-type hangar “immediately adjacent to the newly built airfield as an auxiliary rest and refueling stop for American pilots ferrying Lend-Lease aircraft to Fairbanks” added to the facilities of the airfield.⁴² Despite the construction, the mechanics had insufficient training and supplies for the work they were expected to perform.⁴³

These, and other issues help explain why, although the straight flying time over the Northwest route was only nine to fourteen hours, the average length of transit for a plane from Great Falls to Fairbanks was 25.3 days.⁴⁴ Especially in the winter, when daylight would last for only a few hours and bad weather could keep planes grounded for days, pilots would be forced to land at each base along the route, emphasizing the necessity of airfields such as the one at Big Delta to facilitate year round aid to the Soviet Union.⁴⁵ The unusually severe winter weather that arrived in November 1942 exacerbated the existing structural problems with the Northwest route,

⁴⁰ Ibid., 80.

⁴¹ Ibid., 38.

⁴² Tetra Tech, Inc., “Inventory and Evaluation,” 3-10.

⁴³ Smith, *Warplanes to Alaska*, 84.

⁴⁴ Smith, “The Northwest Route,” 27, 34.

⁴⁵ Ibid., 34.

and combined with the confusion caused by the last-minute Soviet vacillation, kept the Americans from meeting the promised volume of aid during the waning months of the year.⁴⁶

Only 148 aircraft were delivered to the Soviets in the last four months of 1942, a far cry from the promised 142 planes per month. As time progressed, however, the system became more efficient, and the Americans exceeded their goal by April 1943.⁴⁷ By the end of the war, the Soviet Union received 7,925 planes via ALSIB, including 2,397 P-63 Kingcobra fighters, 2,618 P-39 Aircobra fighters, 1363 A-20 light bombers, and 710 C-47 Skytrain cargo planes.⁴⁸ Deliveries via this route accounted for nearly half of the 14,798 total planes, worth over \$1.1 billion delivered to the Soviets over the course of the war through the Lend-Lease program.⁴⁹

Though the Soviets would not allow American military observers to join their forces or inform Americans of how and where they were using Lend-Lease materials, making it difficult to understand the role American aid played in the overall Soviet war effort, Stalin himself acknowledged the importance of American aircraft to Soviet forces. The Soviet leader admitted to Roosevelt that the “arrival of airplanes, without fliers (we have enough fliers of our own) at the Southwestern or Central front would play an enormous role on the most important sectors of struggle against Hitler.”⁵⁰ The near parity of German and Soviet aircraft production meant that even small numbers of American planes could be decisive. A few reports on the use of American

⁴⁶ Hays, *The Alaska-Siberia Connection*, 51.

⁴⁷ *Ibid.*, 51, 57.

⁴⁸ Jones, *Roads to Russia*, 272; and Smith, “The Northwest Route,” 42.

⁴⁹ Hays, *The Alaska-Siberia Connection*, 56; and War Department, *International Aid Statistics, World War II: A Summary of War Department Lend-Lease Activities* (International Branch, Headquarters, Army Service Forces, War Department, 1945), 21.

⁵⁰ Van Tuijl, *Feeding the Bear*, 62.

planes did reach the West, and both German and American observers believed that the American aid did play a material role in allowing the Soviets to achieve at least numerical air superiority.⁵¹

With the end of the war, however, the entire Lend-Lease program to the Soviet Union abruptly ended. On September 2, V-J Day, Washington ordered the suspension of all Lend-Lease deliveries around the world. For the ALSIB route, this meant that at least twenty C-47s that had reached Fairbanks for delivery were grounded, and eventually transferred to the possession of the Alaskan Department.⁵² By October 9, the last Soviet personnel departed Alaska, and the once critical bases of the Northwest route lost their *raison d'être*.⁵³

Even before the last planes made their way north to Fairbanks, the inevitable end of hostilities initiated a drawdown of forces in Alaska, and in August 1945, the Big Delta Airfield, which, during a reorganization of the Alaska Wing (AW), Air Transport Command in September 1943, had been designated Section 17 AW ATC, was closed.⁵⁴ The airfield was returned to the care of the CAA to be operated as a commercial airfield with only a skeleton army crew left to maintain the facility.⁵⁵

⁵¹ *Ibid.*, 114-115.

⁵² Hays, *The Alaska-Siberia Connection*, 131.

⁵³ *Ibid.*, 132.

⁵⁴ Woodman, *Duty Station Northwest*, Vol. 3, 13, 15.

⁵⁵ *Ibid.*, 15; and Tetra Tech Inc., "Inventory and Evaluation," 2-4.

Chapter 2- Fighting a Cold War in Cold Weather

Though the end of World War II seemed to spell the end of any significant military presence in Big Delta, the tensions of the Cold War ensured that that would not be the case. The military importance of Alaska during the war had placed the formerly forgotten territory firmly within the national defense mindset, and led to levels of public awareness unprecedented even in the boom years of the Gold Rush.¹ Most of this attention focused on Alaska's position astride the Great Circle air route, and military strategists warned of the vulnerability of the Lower Forty-Eight should an enemy (who in the calculations of planners would presumably be the Soviet Union) make inroads into the territory and take over isolated airfields for the use of their own bombers.²

Top military officials in the interlude between World War II and the conflict in Korea worried that inadequate garrisons at the newly constructed airfields in Alaska could easily be overrun by a surprise attack and the resulting entrenched enemies would be "extremely difficult to dislodge."³ Politicians in Congress also voiced concerns over Alaska's vulnerability, with a representative from California stating, "Soviet Russia is looking at Alaska with covetous eyes."⁴ Lending credence to this assertion was a 1948 article in *Foreign Affairs* that highlighted the apparent commitment within the Soviet Union to arctic development, and the evidence of a Soviet commitment to a "polar strategy" that would necessarily threaten Alaska.⁵

¹ Whitehead, "Alaska and Hawai'i," 194.

² Maj. George W. A. Beyer, "Alaska: Barrier or Gateway?," *Military Review* 33, no. 6 (September 1953): 35.

³ Gen. J. Lawton Collins, quoted in Lt. Col. R. E. Moore, "An Observer with Exercise Yukon," *Military Review* 28, no. 7 (October 1948): 20.

⁴ Rep. Bertrand W. Gearhart, quoted in Jonathan M. Nielson, *Armed Forces on a Northern Frontier: The Military in Alaska's History 1867-1897* (New York: Greenwood Press, 1988), 183.

⁵ John J. Teale, "Alaska: Fulcrum of Power," *Foreign Affairs* 27, no. 1 (October, 1948): 93.

Concurrent with the fear of Soviet inroads into Alaska was the awareness that U.S. readiness to wage war in extreme cold was woefully inadequate. This weakness had been exposed during the campaign to retake the Aleutian island of Attu from Japanese forces in 1942. During the three weeks of fighting on the island, more soldiers became casualties due to the severe cold than were wounded by enemy fire: 1,200 injuries due to cold compared to 1,148 wounded by the Japanese.⁶ Though the impact of the cold on this campaign caused changes in military equipment during the war, American officials recognized the necessity of winter training for individual soldiers as well. On Attu, prolonged exposure to severe cold caused men to shut down mentally and physically and be unresponsive when called into action.⁷ Following the war, the Army sought answers from captured German officers regarding the requirements for successful winter campaigns, especially against the proven winter-ready forces of the Soviet Union.⁸

Thus, even before the Soviet Union proved its ability to threaten the entire globe with its nuclear capabilities, its massive conventional forces, and especially the build-up of such forces in Siberia, proved sufficient to spur a reversal of the cutbacks that had immediately followed the war's end.⁹ To prevent some of the inter-service squabbles and miscommunications that had plagued the wartime operations in Alaska, the Joint Chiefs of Staff created the Alaskan Command (ALCOM) on January 1, 1947, the first unified command created by the Joint

⁶ Naske and Slotnick, *Alaska: A History*, 185.

⁷ Maj. Richard F. Vaughan, "Cold Memories: An Examination of U.S. Army Doctrine for Combat in Cold Regions" (Monograph, School of Advanced Military Studies, U.S. Army Command and General Staff College, Fort Leavenworth, KS, 1988), 24.

⁸ *Ibid.*, 25.

⁹ Truman R. Strobridge, *Strength in the North: The Alaskan Command 1947-1967* (Alaska: Elmendorf Air Force Base [Alaskan Command], 1966), 17; and Nielson, *Armed Forces on a Northern Frontier*, 181.

Chiefs.¹⁰ From that point onward, the Alaskan Air Command (AAC), U.S. Army Alaska (USARAL), and the Alaskan Sea Frontier (ALSEAFRON) would all be directly under the control of Headquarters ALCOM, with Lieutenant General Howard A. Craig, who reported directly to the Joint Chiefs of Staff, in command.¹¹

Almost concurrently with the creation of the ALCOM came the National Security Act, which, along with establishing the position of the Secretary of Defense, formally separated the Air Force as a separate branch of the armed forces of the United States.¹² These organizational shake-ups created logistical headaches for the Alaskan military installations affected, necessitating some transfers of responsibility. Accordingly, several Joint Army-Air Force Adjustment Regulations were issued, the second of which transferred the airfield at Big Delta to the control of the newly created Air Force.¹³ The seemingly insignificant base, which had been in caretaker status since the summer of 1945, was soon to take center stage in the first post-war cold weather maneuver.¹⁴

In March 1947, ALCOM began to make plans for an exercise, “the first of its kind in Alaska,” to be held the following winter of 1947-48.¹⁵ Dubbed Exercise Yukon, the Defense Department chose the Big Delta Airfield for the maneuvers.¹⁶ In October, news of the maneuver was made public, with the commander of the army ground forces Gen. Jacob L. Devers making a

¹⁰ Dwight D. Eisenhower, “Memorandum by the Chief of Staff, U.S. Army,” *The Papers of Dwight David Eisenhower: Volume 9, The Chief of Staff*, 1983.

¹¹ Nielson, *Armed Forces on a Northern Frontier*, 182.

¹² Kathy Price, *Northern Defenders: Cold War Context of Ladd Air Force Base Fairbanks, Alaska 1947-1961* (Fort Collins, CO; Fort Richardson, AK: Center for Ecological Management of Military Lands; Natural Resources Branch U.S. Army, Alaska, 2001), 8.

¹³ Strobridge, *Strength in the North*, 47.

¹⁴ Woodman, *Duty Station Northwest*, Vol. 3, 55.

¹⁵ *Ibid.*

¹⁶ *Ibid.*

statement about the planned exercise, and noting the importance of Alaska's defense.¹⁷ Exercise Yukon's stated purpose, according to the Headquarters, Army Ground Forces, was:

To develop air transportability methods for the Arctic.

To develop methods of training and indoctrination of ground force units for Arctic operations.

To carry out a series of maneuvers in Alaska involving air transportability and defense of airfields.

To make observations and records of all operations in order to furnish a basis for the development of doctrines, tactics, techniques, and organization for future Arctic operations.¹⁸

Underlying the thought process behind the exercise was the continued threat of armed takeover of Alaskan or other northern outposts; it was no accident that the units chosen for the training were taken from the 2nd Division stationed at Fort Lewis, Washington, as these were the closest troops who would be called upon "in the event of a true emergency."¹⁹ The initial idea was that the entire 2nd Division would take part in the exercise, but ALCOM was forced to inform Washington that it "couldn't begin to support such a force for a few days, much less for the winter," and the Air Force did not have the troop transport capacity to move that many men to Alaska in the first place.²⁰ Subsequent discussions proposed a "regimental combat exercise team," and then a battalion, before finally settling on one company at a time, the largest force that the military infrastructure in Alaska could support.²¹

The exercise would be spread out over four months, November 1947 through February 1948, with each month seeing a different company participate in a unique scenario. The four groups were "augmented rifle companies of 250 officers and enlisted men each...Each company

¹⁷ "Army to Train GI's in Alaska During Winter," *Chicago Tribune*, October 7, 1947, 5.

¹⁸ Moore, "An Observer with Exercise Yukon," 12.

¹⁹ Woodman, *Duty Station Northwest*, Vol. 3, 55.

²⁰ John G. Norris, "U.S. Army Presents Curious Parallel to 1941 Conditions," *The Washington Post*, May 18, 1947, sec. M.

²¹ *Ibid.*

was to consist of an infantry rifle company of 6 officers and 150 enlisted men, plus such additional elements that all combat units of an infantry division would be represented by at least a platoon in one of the four companies. Each company was to be commanded by a field officer.”²² The companies were designated Ucon A, to arrive in November, Ucon B for December, Ucon C in January, and Ucon D in February.²³

Even before they arrived in Alaska, the men of the 2nd Division received three phases of training to prepare for the exercise. First, since air transportability was a major component of the exercise objective, three officers and twelve enlisted men chosen from among the troops slated for the exercise received training in “history of air movement; basic loading theory to include knots and lashings, computation of weights and balances, and actual demonstrations of loading; air movement doctrines, tactics, theory, and techniques; and classroom air movement exercises” from members of the 82nd Airborne.²⁴ Once this vanguard had received their training, they passed on their newly acquired knowledge to the rest of the participants, and all the troops soon participated in training flights, with an emphasis on the organized loading and unloading of the aircraft with both men and equipment, and on the part of the loading officers, “flexibility of plans...to insure quick adaptability to the actual conditions at the time of emplaning. It was stressed that in the event the planned number of planes was not available, each commander must know exactly what equipment he intended to leave behind.”²⁵ The training even included a simulated defense of a Washington airfield from an “enemy” airborne unit to further test the new skills of the groups.²⁶

²² Moore, “An Observer with Exercise Yukon,” 12.

²³ Woodman, *Duty Station Northwest*, 55.

²⁴ Moore, “An Observer with Exercise Yukon,” 13.

²⁵ *Ibid.*

²⁶ *Ibid.*

After the soldiers had shown their proficiency with the use of air transport, they received some “Pre-Arctic school” training, focusing on the “repair of skis and snowshoes; winterization of ordnance, signal and engineer equipment; and care and use of Arctic clothing and equipment.”²⁷ Finally, the troops went through a period of acclimatization training on the slopes of Mt. Rainier, Washington intended to somewhat prepare them for the conditions they would encounter in Alaska. They focused on the practical aspects of surviving in a frigid environment, including “Arctic cooking; snow melting... fire building and fire prevention... frost bite... construction of Arctic shelters; ski instruction... [and the] buddy system.”²⁸ While there, the troops split into five-man teams and learned to survive together in a tent. Each company spent three weeks on their acclimatization training prior to departure for Alaska, and received valuable preparation for the exercise to come.²⁹

Dr. Paul Siple, an Arctic explorer and expert, explained the purpose of this extensive training in somewhat clearer terms before the first company departed for Alaska:

The cold is unusual, but you can defeat it... The objective of Exercise Yukon is to determine whether, after adequate training, a group of men can drop into an area by air, be self-sufficient, and still have time left to actually fight or carry out a mission. That is the one big question we are trying to answer. This exercise will be a success if, on the final five day maneuver, you can land on one of the outlying airfields, establish yourselves, take care of yourselves, and have time left to carry out a specific assigned mission. We have every reason to believe it can be done, but it hasn't been proved militarily.³⁰

²⁷ Ibid.

²⁸ Ibid.

²⁹ Ibid., 14.

³⁰ Quoted in Moore, “An Observer with Exercise Yukon,” 12.

The route the troops traveled to reach Alaska mimicked the ALSIB route of World War II. Little had changed in the two years since the war's end, and the rough route of the Alcan Highway was the only indication of civilization for most of the journey.³¹

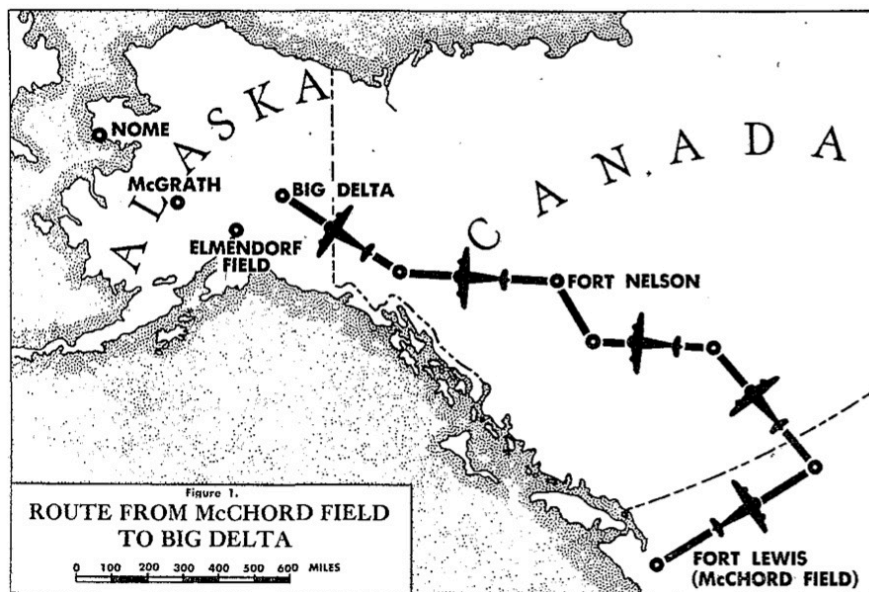


Figure 1- Route to Alaska³²

Like clockwork, every month from November to February, Fairchild C-82 transports arrived, bringing the next company to Big Delta Airfield, which would serve as a staging area.³³

Upon arrival at Big Delta, each company was issued some specialized equipment, including tents, stoves, skis, snowshoes, and toboggans, and went through further preliminary training exercises. For Ucon B, which departed McChord Field, Washington on November 30 and spent six days in transit to arrive in Alaska on December 5, this training took the form of a three-day “shakedown exercise” in the area of Big Delta to ensure that no unforeseen

³¹ Ibid., 15.

³² Ibid.

³³ Woodman, *Duty Station Northwest*, Vol. 3, 55.

complications resulting from the trip or the northern climate would appear once the main event was underway.³⁴

On December 6, while the troops were still familiarizing themselves with the Alaskan terrain, a set of General and Specific Situations were issued:

General Situation

Late in November, Commander in Chief, Alaska [CINCAL], received the following message from the Joint Chiefs of Staff:

Current intelligence indicates that an attack on the United States is imminent. Enemy is capable of delivering limited air and airborne attacks on airfields in your theater. Second Infantry Division and "X" troop carrier squadron are immediately available to you. You will be advised as to further availability of forces to implement your plans. Acknowledge.

CINCAL ordered that a reinforced rifle company, 2d Infantry Division, be air-transported to Big Delta immediately for an urgent and specific task to be assigned upon arrival in the theater.

Special Situation

Ucon Company B, reinforced, from the 2d Infantry Division, has arrived at Big Delta, Alaska. The 7th Troop Carrier Squadron, consisting of fifteen (15) C-82 aircraft, has arrived at Elmendorf Field for the purpose of transporting Ucon Company B any place that it may be ordered. Both units have been placed under the Commanding General, Alaskan Air Command, who has delegated operational control to the Commanding General, Yukon Sector. The Commanding General, Yukon Sector, has ordered Ucon Company B and the 7th Troop Carrier Squadron to be ready to move to any point in Alaska, combat loaded, upon twenty-four (24) hours notice.³⁵

That notice came on December 11 in the form of a message from the Commanding General, Yukon Sector. The "mission" assigned to Ucon Company B was revealed:

Aggressor forces have captured U.S. Airdrome at Nome, Alaska. Aggressor reconnaissance aviation has been active over McGrath. Ucon Company B will move by air to McGrath, 12 December 47. Seventh Troop Carrier Squadron will provide fifteen (15) C-82 Type Aircraft for the move. Fifty-seventh Fighter Squadron will provide air cover, escort, and interception for movement. Commanding officer Big Delta Air Base will provide protection during loading phase. End.³⁶

³⁴ Moore, "An Observer with Exercise Yukon," 15; and Woodman, *Duty Station Northwest*, Vol. 3, 55.

³⁵ Moore, "An Observer with Exercise Yukon," 15-16.

³⁶ *Ibid.*, 16.

Once these orders were received, Ucon Company B officers created a plan for the defense of the McGrath airfield and began preparing for the move to the more remote location.

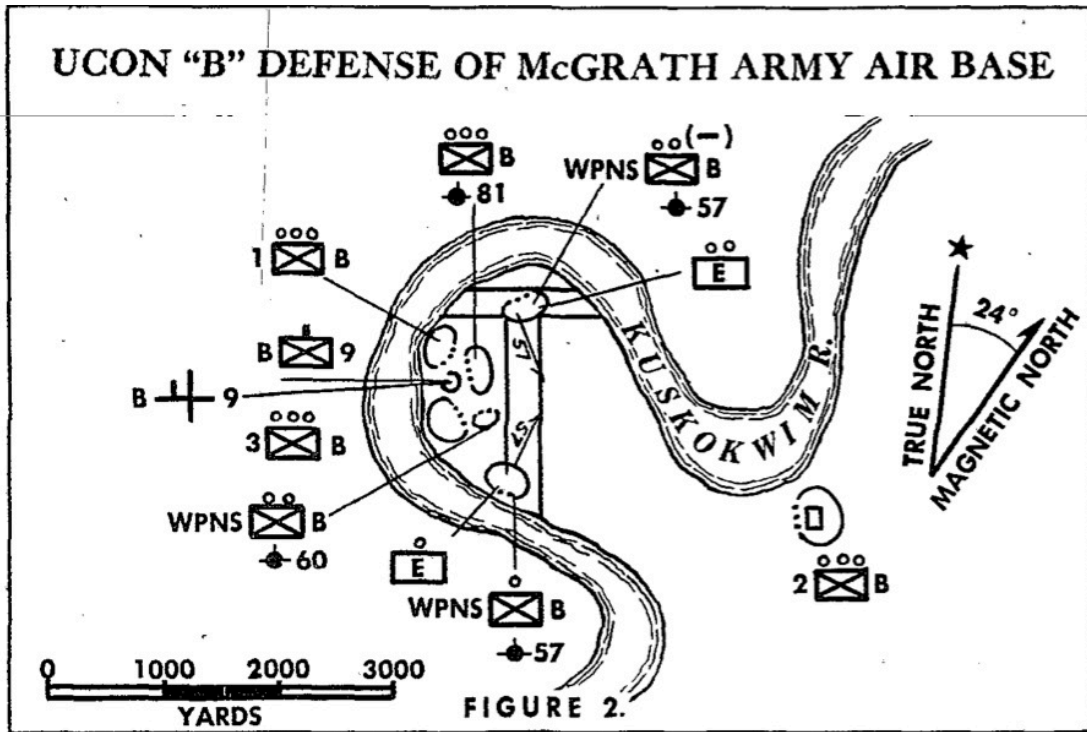


Figure 2- Plan of 'Battle' for Exercise Yukon³⁷

Immediately upon arrival to McGrath, having been protected from “Aggressor” fighters on the journey, Ucon B found their movements hampered by snow depths officially reported as twenty-two inches, though some areas boasted much deeper snow.³⁸ As an observer of the exercise noted, “Despite the use of snowshoes, skis and toboggans, it proved to be a man-sized job merely to transport equipment from the aircraft on the runway to the bivouac areas a few hundred yards distant. It was evident that the movement of troops from their bivouac area to any threatened sector would be a slow and laborious process.”³⁹ The defenders recognized, however, that the same difficulties would hamper the movements of the “aggressors” as well. Additionally,

³⁷ Ibid.

³⁸ Ibid., 17.

³⁹ Ibid.

Ucon B found that the M-29 C “Weasel” tracked vehicles proved very useful in packing down paths through the snow, giving defenders an advantage.⁴⁰

After Company B arrived, attacks from small “Aggressor” forces, led by several officers who were previously members of the Alaska Scouts, and therefore were very well-versed in snow mobility, tested them.⁴¹ The same pilots from the 57th Fighter Group who had “protected” Company B on its journey to McGrath carried out simulated air attacks on December 14th, which were followed by a simulated airdrop and ground attack by aggressor forces, against which Company B held its ground, “though results of the air attack were not taken strictly into account.”⁴² On the 15th and 16th, the roles were reversed, and members of Ucon B trekked to a simulated drop zone east of the airfield to try their hand at dislodging aggressor forces from their supposed toehold on a “captured” airbase.⁴³ These exercises clearly aimed at preparing for the type of attack that many in Washington feared was likely to come from the Soviets, involving the remote airfields of Alaska.

By December 18, Company B’s portion of the exercise was finished, and the C-82s arrived to return the troops to Big Delta to complete their thirty-day stay in Alaska.⁴⁴ Ucon B’s successful “defense” of, and “attack” on, McGrath airfield in December was preceded by Ucon A’s similar exercise at Galena in November and followed by Ucon C’s maneuvers in January, which also took place at Galena, and Ucon D’s excursion to Nome in February.⁴⁵ Each company spent five days at its isolated target, with the remainder of their time in Alaska spent at Big

⁴⁰ Ibid.

⁴¹ Ibid., 18.

⁴² “History of Big ‘D’” from Thomas Leonhardt collection, Archives, University of Alaska Fairbanks.

⁴³ Moore, “An Observer of Exercise Yukon,” 18.

⁴⁴ Ibid.

⁴⁵ Woodman, *Duty Station Northwest*, Vol. 3, 55-56.

Delta.⁴⁶ The only major problems discovered involved logistics: a shipping strike that lasted through December 1947 affected the transport of supplies to Alaska, and weather-related delays to C-82 flights, including a period in December of installation of de-icing equipment meant that troops could have been transported more quickly by sea.⁴⁷ These issues did not prevent the exercise from being a success, however, and when the final group completed its stay in early March 1948, the exercise had not only supplied invaluable experience to the troops involved, it had also highlighted the value of the post at Big Delta for cold weather training purposes.

In assessing the lessons learned from Yukon, observer Lt. Col. R. E. Moore emphasized the importance that prior training in Arctic survival and tactics had played in allowing the troops to effectively operate in the field. Despite the fact that during his period of observation temperatures only fell to -15 F°, dealing with the cold seriously affected every aspect of operations, making even simple tasks such as cooking a meal much more complex and time-consuming. Bulky cold weather clothing hampered movement, and the danger of overheating due to exertion in the cold was always present.⁴⁸ If a fighting force were to be needed in the Arctic, it would be critical that those being transported to the front were already apprised of the basics of cold-weather survival and could focus on the enemy.

Only two months after the close of Exercise Yukon, preparations began for the establishment of a permanent training facility at Big Delta. On May 1, 1948, the post was officially transferred away from the Air Force to the jurisdiction of the Department of the Army, and the post was named “U.S. Troops, Big Delta, Alaska.”⁴⁹ Command went to Major Joseph

⁴⁶ “History of Big ‘D.’”

⁴⁷ “For Ending Alaska Strike: Gruening Asks Truman to Act So Shipping May Be Resumed,” *New York Times*, August 17, 1947; and Woodman, *Duty Station Northwest*, Vol. 3, 56.

⁴⁸ Moore, “An Observer with Exercise Yukon,” 18-19.

⁴⁹ *Ibid.*, 59.

Venezia, and in November of that year, the Army Arctic Indoctrination School was established at the post.⁵⁰ The Arctic Indoctrination School grew out of the same fear of a northern invasion route as most of the rest of the post-war military build-up in Alaska. As Exercise Yukon illustrated, preparation was key to Arctic warfare, and the perception that the Soviets were infinitely better prepared to fight in the cold was, as earlier noted, a common trend in military thinking immediately post-World War II.⁵¹ Central to the establishment of the Arctic Indoctrination School was the idea that “the destiny of the United States may some day be at stake in the whistling winds and frigid air of our northern outpost.”⁵²

It was to “insure that the United States Army would be prepared to carry out its share in safeguarding ‘the destiny of the United States’ in the Arctic [that] an indoctrination program to familiarize officers and enlisted personnel with Arctic problems and techniques was instituted.” At the very beginning, the staff of instructors and operating units consisted of approximately 140 officers and men, consisting largely of volunteers from the 23rd Infantry Regiment.⁵³ The winter of 1948-49 saw the first classes conducted at the Indoctrination School under commandant Lt. Col. Walter Al Downing, with two four-week courses bringing Arctic training to 75 officers and enlisted men from the Lower 48, including several Navy and Air Force personnel, and 25 selected men from ALCOM forces.⁵⁴ The post also hosted “several test groups of the technical services test[ing] clothing and other equipment” during that winter, including “Operation

⁵⁰ Ibid.; “History of Big ‘D.’”

⁵¹ Vaughn, “Cold Memories,” 25-26.

⁵² Army Armed Forces Talk, “Alaska--Our Northern Outpost,” quoted in Lt. Col. James L. Collins, Jr., “The Army Arctic Indoctrination School,” *Military Review* 29, no. 5 (August, 1949): 28.

⁵³ “History of Big ‘D.’”

⁵⁴ Collins, Jr., “The Army Arctic Indoctrination School,” 29; and Woodman, *Duty Station Northwest*, Vol. 3, 83.

Greaseball,” which involved “nearly three months testing new lubricants and automotive items in the extreme cold.”⁵⁵

On July 1, 1949, U.S. Troops, Big Delta, Alaska was renamed the Army Arctic Training Center (AATC) to more appropriately reflect the various activities underway at the base.⁵⁶ The various units stationed at the base were also reorganized at this time into three distinct groups.

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Figure 3- Photo of Army Arctic Training Center Headquarters, circa 1950⁵⁷

The Headquarters and the Headquarters Company of the Army Arctic Training Center were given their own mission statement separate from that of the Indoctrination School:

1. Normal station operation and maintenance, including auxiliary landing field
2. Station level support for the AAIS, ATB (AFF), and any other organization may be temporarily or permanently assigned.
3. Defend Big Delta AFB.
4. Provide a mobile force for use in defense of other areas of the theatre.⁵⁸

Though the original wartime construction at the base was spartan, the AATC did its best to provide those stationed in Big Delta some of the normal services of a military base.⁵⁹ The small

⁵⁵ “History of Big ‘D.’”

⁵⁶ Ibid.

⁵⁷ Thomas Leonhardt Collection, University of Alaska, Fairbanks, Archives.

⁵⁸ “Headquarters Army Arctic Training Center Mission,” Thomas Leonhardt Collection, University of Alaska, Fairbanks, Archives.

base vastly expanded its services during the waning months of 1948 until it could offer a Service Club, Chapel, Commissary, Dispensary, and Post Exchange.⁶⁰

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Figure 4- Clockwise from bottom left- Chapel, Commissary, Post Exchange, Dispensary circa 1950⁶¹

The Army Arctic Indoctrination School itself occupied “a cluster of Quonset huts and Jamesway shelters located about a mile from the main post and landing strip.” It was from here that it would seek to fulfill its official mission, which stated:

The Army Arctic Indoctrination School is to provide instruction in summer and winter military operation under arctic and sub-arctic conditions, to include arctic survival, mountaineering, and tactical, technical, and logistical problems. To provide officers of the ground arms and services with a sound basic knowledge of arctic conditions to

⁵⁹ “History of Big ‘D.’”

⁶⁰ Ibid.

⁶¹ Thomas Leonhardt Collection, University of Alaska, Fairbanks, Archives.

include terrain and weather, survival, movement, logistics, and minor field operations, and thereby make available a reservoir of leaders and instructors in arctic operations.⁶²

Key to the choice of Big Delta for the school was the wide variety of terrains to be found in the immediate vicinity of the base: “mountains, plains, forests, muskeg, tundra, glaciers, rivers, lakes, and swamps. Snow cover is also typical, varying from none on clear, wind-swept flats to from three to eight feet in the heavily-timbered and mountainous areas.”⁶³

By August 1949 staffing for the school included five officers who were “veterans of extensive arctic experience and [had] themselves encountered most of the situations that a soldier might find in the far North.”⁶⁴ The instruction at the school encompassed both physical and psychological preparation for the cold. Psychological training focused on counteracting the possible demoralizing effect of a fear of the cold. By exposing students to extended periods of cold, and exhibiting the survivability of even extreme temperatures with minimal equipment, the school taught by example.⁶⁵

Concurrently, physical training focused on survival and transportation. Personal transportation methods in the curriculum included the use of skis and snowshoes, with an emphasis on the fitness and skill required to successfully transport necessary equipment via those methods.⁶⁶ Survival skills taught included “the preparation of individual rations, the building of lean-tos and snow caves, and the proper use of cold weather clothing and equipment.”⁶⁷ In addition to these main areas, the school also provided instruction in “Hunting and Fishing in the

⁶² “Army Arctic Indoctrination School Mission,” Thomas Leonhardt Collection, University of Alaska, Fairbanks, Archives; and Collins, Jr., “The Army Arctic Indoctrination School,” 28-29.

⁶³ “Army Arctic Indoctrination School,” Thomas Leonhardt Collection, University of Alaska, Fairbanks, Archives.

⁶⁴ Collins, Jr., “The Army Arctic Indoctrination School,” 29.

⁶⁵ Ibid.

⁶⁶ Ibid.

⁶⁷ “Army Arctic Indoctrination School,” Thomas Leonhardt Collection.

Arctic, First Aid and Sanitation, Over-Snow Vehicle Operation, Over-Snow Freighting, Land Navigation, Geography of Alaska, Terrain and Weather, and Tactical Operations in the Arctic.”⁶⁸

All these skills were taught by experience, with ninety percent of time in the course spent in the field, despite any adverse weather conditions, in accordance with the school motto: “There is no substitute for experience.”⁶⁹

Obviously, the original motivation behind the establishment of the Arctic Indoctrination School was the need for Army training in extreme cold temperatures. The northern regions, however, can be even more difficult to operate in during the summer months. Assuming a conflict was to arise that involved ground troops in a northern terrain, the eventual thaw of the winter snow and ice would bring myriad new problems (quite literally, since the vast amounts of standing water left after the spring melt lead to untold billions of mosquitoes). In recognition of this, in the spring of 1950, the Indoctrination School received direction to test a new summer regimen of study.⁷⁰

Following successful tests in the summers of 1950-51, the Indoctrination School instituted summer courses that sought to counteract the single greatest difficulty troops would face in an Arctic summer: mobility, or a lack thereof. In the area around Big Delta were to be found, as earlier noted, different types of terrain representative of nearly all to be encountered in the Arctic, so troops were able to tackle mountains, highlands, and lowlands, and all the vagaries of transport those regions could provide.⁷¹ The summer courses provided training in cross-country foot and tracked vehicle travel atop highly unstable muskeg and tundra, rock and glacier

⁶⁸ Ibid.

⁶⁹ Ibid.

⁷⁰ Maj. Edwin C. Gibson, “Summer Arctic Operations,” *Military Review* 32, no. 7 (October 1952): 50.

⁷¹ Ibid., 51-60.

climbing, and the operation of small boats on inland waterways for the transport of men and supplies.⁷²

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Figure 5- Clockwise from bottom left- Winter Hexagonal Tent, Winter Skijoring Instruction, Summer Glacier Climbing, Summer Boat Course⁷³

The final part of the reorganization of the Big Delta Post added a new unit in mid-July of 1949 with the arrival of the main body of the Arctic Test Branch of the Army Field Forces.⁷⁴ The test branch was tasked with the following mission: “The Arctic Test Branch will conduct service tests of Army Field Forces Equipment under Arctic and Sub-arctic terrain conditions. It will recommend military characteristics for special Arctic equipment to use in the Arctic and develop

⁷² “Army Arctic Indoctrination School,” Thomas Leonhardt Collection.

⁷³ Thomas Leonhardt Collection, University of Alaska, Fairbanks, Archives.

⁷⁴ “History of Big ‘D.’”

data on the effects of Arctic and Sub-arctic environment on personnel and Army Field Forces Equipment.”⁷⁵ The Arctic Test Branch served as a replacement for the temporary task forces and detachments that had conducted small and large scale testing from 1946 to 1949. Operations like Task Force Frigid, a testing program involving nearly 1,600 men assigned to Ladd Field in Fairbanks in 1946, provided valuable information for the test boards, but the temporary nature of the task force prevented comprehensive testing in all possible weather conditions.⁷⁶ Task Force Williwaw on Adak Island, and Task Force Frost at Camp McCoy, Wisconsin, as well as various other smaller scale test detachments suffered from the same limitations, and made the need for a permanent establishment clear.⁷⁷

Organizationally, the Arctic Test Branch was a supplement to the other test boards established after the war to streamline the piecemeal system of materiel testing that the exigencies of wartime had shown to be insufficient for the requirements of the service.⁷⁸ The ten test boards, each focused on a different arm or service, that had directed wartime testing were consolidated into three ground force boards in 1945, with a fourth board added in 1946. Together, these boards had the responsibility of “evaluating recommendations for development, preparation of military characteristics, and performance of user test for equipment of the field army.”⁷⁹

The US Army Airborne, Electronics, and Special Warfare Board at Fort Bragg, NC, the Air Defense Board at Fort Bliss, TX, the US Army Armor and Engineer Board at Fort Knox, KY, and the Infantry Board at Fort Benning, GA all had representative branches at the Arctic

⁷⁵ “Arctic Test Branch Army Field Forces Mission,” Thomas Leonhardt Collection, University of Alaska, Fairbanks, Archives.

⁷⁶ Woodman, *Duty Station Northwest*, Vol. 3, 86; and “Arctic Test Branch.”

⁷⁷ “Arctic Test Branch.”

⁷⁸ *Ibid.*

⁷⁹ *Ibid.*

Test Branch, with the Alaskan branch reporting to the parent board on equipment under its jurisdiction.⁸⁰ To bring cohesion to the different branches with the Branch and make it into a viable unit, a Headquarters, a Maintenance Section, a Supply Section, and a Headquarters Detachment were established.⁸¹

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Figure 6- Headquarters, Arctic Test Branch, circa 1950⁸²

Though the Test Branch consisted of twenty-nine officers, two warrant officers, 256 enlisted men, and eleven civilian employees, it still required support from the main post for base level support.⁸³ Decisions on testing were made at the Army Field Forces level and filtered through the parent test boards in the Lower 48, with the Arctic Test Branch receiving orders on “the plan of test and the method and conditions under which the test is to be made” from the parent board. Once completed, reports on the test made their way in a reverse order back to the Army Field Forces.⁸⁴

42.

⁸⁰ Ibid.; Col. William D. Meara, “The Army Test Mission,” *Military Review* 48, no. 7 (July 1968):

⁸¹ “Arctic Test Branch.”

⁸² Thomas Leonhardt Collection, University of Alaska, Fairbanks, Archives.

⁸³ Ibid.

⁸⁴ Ibid.

A wide variety of items underwent testing at the Branch, including various types of clothing, footwear, vehicles, boats, aircraft, and every other conceivable piece of military equipment.⁸⁵ The work of the Arctic Test Branch, along with the training conducted at the Arctic Indoctrination School, provided valuable support to the overall cold weather fighting abilities of the United States Army. From near oblivion in 1945, the post at Big Delta found itself hosting activities that fulfilled a vital role in the Army mission.

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Figure 7- Clockwise from bottom left- Heavy Cargo Sled Test, Oversnow Vehicle Test, Cold Weather Clothing Test, Test of Howitzer in Deep Snow⁸⁶

⁸⁵ Woodman, *Duty Station Northwest*, Vol. 3, 90.

⁸⁶ Thomas Leonhardt Collection, University of Alaska, Fairbanks, Archives.

The 1950s found both testing and training firmly in place, and a period of intense construction provided the expanding base with many new structures. A World War II-era mess hall was rebuilt in 1950 after a fire, and 1954 and 1955 saw the completion of a new post exchange, family housing, barracks, gymnasium, fire station, commissary, gas station, power plant, and various other base infrastructure.⁸⁷ The culmination of this frenzy of construction came on July 1, 1955, when the post was officially renamed Fort Greely in honor of Maj. Gen. Adolphus W. Greely, a famed arctic explorer and pioneer of communication.⁸⁸ The new fort was the second permanent post-war fort in Alaska, following Fort Richardson near Anchorage, and its creation and continued existence largely were owed to the heightening tensions of the Cold War and the fear of the Soviet Union.

⁸⁷ TetraTech, "Inventory and Evaluation," 3-16, Table 3.3-1.

⁸⁸ Woodman, *Duty Station Northwest*, Vol. 3.

Chapter 3 - Testing and Training at Fort Greely

On June 21, 1955, Army General Orders (GO) Number 40 officially withdrew the name “Greely” from the World War II-era site on Kodiak Island, Alaska and assigned it to the installation at Big Delta that had been formally designated as a permanent installation on August 16, 1954 with GO 60.¹ Despite the name change, the mission of the troops stationed at the post remained essentially the same. The location of the newly renamed fort made it uniquely important for an army engaged in a Cold War for two reasons: first, the cold climate and varied terrain of interior Alaska provided unparalleled opportunities for testing equipment and training soldiers in cold weather, and second, the relatively remote location allowed for a wide range of training and testing activities, including live-fire exercises.

The Arctic Indoctrination School continued its mission as an installation at Fort Greely, serving as one of two training sites for cold weather and mountain operations along with Camp Carson, CO.² In 1957, however, the Army decided to reduce the overlap, and the Mountain Training Center in Colorado was closed, with “all responsibility for cold weather and mountain training” going to the Indoctrination School.³ To better reflect its widened scope of instruction, it was renamed the Army Cold Weather and Mountain School.⁴ The removal of the word “Arctic” from the name was part of an intentional shift in terminology throughout the Alaskan command, one designed to remove the “mysterious menace” conveyed by terms such as “Arctic” and “sub-zero.” The training at the fort sought to combat “a psychological attitude in the men it trains,

¹ Department of the Army, “General Orders No. 40,” June 21, 1955, Washington, D.C.; and Department of the Army, “General Orders No. 60,” August 16, 1954, Washington, D.C.

² “NWTC History,” <http://www.wainwright.army.mil/nwtc/history.htm>, accessed on April 29, 2014.

³ Headquarters, United States Army, Alaska “United States Army, Alaska,” *Military Review* 38, no. 8 (November 1958): 28; and Hanson W. Baldwin, “The Army in Alaska I- Arctic Post Busy at Weapons Testing, Cold Weather and Mountain Training,” *The New York Times*, Feb 26, 1959, 12.

⁴ “NWTC History.”

which it terms the Fort Greeley [sic] shakes.”⁵ By early 1959, the post, under the command of Col. Richard D. Middlebrooks, who also commanded the Cold Weather and Mountain School, had a permanent garrison of 930 officers and men, with students on temporary assignment generally augmenting that number.⁶ The school taught at least seven regular courses a year, with each course containing about 120 students.⁷

In fulfilling the “Cold Weather” portion of its mission, the school put special emphasis on “developing individuals qualified to perform as instructors,” since cold weather knowledge was still recognized to be lacking, and ignorance of proper cold-weather techniques was considered a serious flaw in the Army’s ability to conduct cold-weather operations.⁸ This did not essentially alter the courses offered, as students for the “four-week cold weather and ski instructors course” or the “ten-day winter orientation course” still learned basic cold weather survival and operational skills, and participated in winter mobility and combat training. Underlying it all was one critical understanding: “the Russians fight at 30 below; we must learn to do the same.”⁹

Even in Alaska’s interior, however, below-zero temperatures do not endure year round. During the brief summers, the “Mountain” portion of the school’s name gained added significance. In 1961, a video camera followed the six-week summer training course to record their activities for the Army’s *The Big Picture* television series, providing a fascinating look at the activities undertaken by students. According to the video’s narration, the 120 men about to embark on the course would “develop skills not only for survival in the rugged high ranges, but

⁵ Baldwin, “The Army in Alaska I.”

⁶ Ibid.

⁷ Ibid.

⁸ Vaughan, “Cold Memories,” 26; and Lt. Col. Erkki Lahdenpera, “Winter Warfare,” *Military Review* 40, no. 3 (June 1960): 46.

⁹ Baldwin, “The Army in Alaska I.”

also for the accomplishment of military missions under the difficult conditions imposed by vertical terrain.”¹⁰

Upon arrival at Fort Greely, students received the equipment and clothing that would be necessary for the course. The first order of business, however, was in the classroom, where students learned about the areas that would be necessary for the coming weeks: map reading, geography, weather observation, and maintenance of supplies. Only after completion of the classroom instruction did students move outside, first learning to rig shelter in the form of a standard ten-man tent or improvised brush and branch lean-tos. Instructors required these preliminaries before students left the relative civilization of the main post of Fort Greely to truly begin their training.¹¹

That training would largely take place at the Black Rapids Training Site, a “satellite instruction facility” thirty-seven miles south of the main post established in 1954 to take advantage of the year-round snow to be found on the higher elevations of the Alaska Range.¹² Black Rapids featured housing for the students, classrooms for any further required indoor training, and recreational facilities for the off hours. Those were few and far between, however, given the intensity of the six-week training program. At nearby Falls Creek, students began basic mountain movement instruction; first simply hiking on the mountain trails, and then gradually moving to steeper and more treacherous terrain. Instructors introduced the men to techniques such as glissading, an elegant term for a decidedly non-elegant method of descent- essentially a semi-controlled slide down a steep slope. The true aim of these exercises was to instill a sense of

¹⁰ “U.S. Army Cold Weather and Mountain School,” *The Big Picture*, Washington, D.C.: Army Pictorial Center, 1961.

¹¹ *Ibid.*

¹² Tetra-tech, “Inventory and Evaluation,” 2-7.

the value of teamwork in the students, as that quality would become more and more critical as they encountered more rugged obstacles.¹³

Before those obstacles could be faced, however, another skill was required: rope-handling. Nearly a week of instruction went into teaching the students the knots necessary for mountaineering. Once those were mastered, students began to learn the basics of rock climbing on the ninety-foot cliffs at Falls Creek, with an emphasis on the proper foot and hand holds. From the tops of the cliffs, students practiced body rappelling using a parachute without the canopy for its 120 feet of nylon line. They also learned to construct a vertical hauling line, which was a simple device consisting of two tree trunks lashed together to form an inverted V-shape. It was secured with a system of ropes to the top of a the cliff, with a knotted rope for aiding a climber suspended from it. It allowed a man to reach the top in a matter of a few seconds with only minimal effort. Even less effort was required for the suspension traverse; essentially a zip-line used for “swift descent or movement from one peak to another.”¹⁴

Cliffs were not the only obstacles that students learned to overcome. Instructors taught them to construct and use rope bridges across streams. The two-line model, consisting only of two ropes suspended vertically atop one another across a stream, required practice and skill for successful use. Students also learned to construct a three-rope bridge, which required more time to put together, but was more suitable for men wearing full field packs. To finish up the instruction at Falls Creek, students were instructed in techniques for medical evacuation, including securing a ‘wounded’ man to a litter and lowering him safely down the face of a cliff under the guidance of two rappelling comrades.¹⁵

¹³ “U.S. Army Cold Weather and Mountain School.”

¹⁴ Ibid.

¹⁵ Ibid.

Once the class had mastered the basics of mountaineering at Falls Creek, instruction moved to nearby Whistler's Creek to take advantage of 120-foot cliffs and ice shelves. Students learned to ascend the nearly sheer ice faces in teams of three and practiced rapidly rappelling down the rock faces, making the 120-foot descent in only three jumps. Training then moved to the Gulkana Glacier, allowing students to learn safe techniques for traveling across glaciers, since glaciers form "excellent lines of communication and transportation through mountains." Students moved across the ice in roped-together formations, with the lead man carefully feeling his way, using an ice ax to probe the snow cover to check for hidden crevices or caverns.¹⁶

The school supplemented training in the mountains with instruction on river operations on the Tanana River, approximately fifteen miles north of Fort Greely. Upon completion of classroom instruction on motor maintenance and operation, boating equipment, and river study, students set out on thirty-foot spruce plank boats to gain experience in reading the river so as to avoid hidden obstacles or shoals, properly beach the boat upon landing, and deal with a man overboard. An intense test of these skills came from one of the final portions of the class, the field exercise.¹⁷

Student instructions were to "move fifty miles up the Tanana River, establish a beachhead, destroy an intermediate objective, and continue overland to [the] final objective." Instructors divided the class into the components of a tactical unit, with one student appointed commander. Under the watchful eye of instructors, students began what would be twelve hours of travel upriver, finally reaching the point at which a beachhead could be established. Once ashore, instructors gave the 'commander' orders for the next move, mimicking a true combat situation where routes and objectives would only be announced as the move was made. Students

¹⁶ Ibid.

¹⁷ Ibid.

were to travel several miles up a gravel riverbed to a timed rendezvous with helicopters. If they missed the rendezvous, they would have to move forty miles on foot to reach the final objective, a trip that would take two days. In the helicopters, however, it was only a matter of minutes, and upon arrival at assembly area ridge, the unit deployed for final attack. A simulated assault brought the field exercise to an end.¹⁸

After the exercise came the final exams, in which instructors tested students on every technique studied since arrival at the school. A passing grade on rope handling, rock-climbing, rappelling, and the many other skills imparted during the class ensured that students could reach graduation day. At a ceremony, the top student in the class was honored, and each student received his diploma for six weeks of hard work. The Army believed that after completion of the course, each graduate was fully equipped to “lead combat soldiers in the most difficult conditions of the rugged north country,” having learned that the “sheer cliffs and bleak tundra of the far north” were not “insurmountable obstacles to military operations.” The morning after the ceremony, transport planes were on hand to return the students to their units across the United States. Every summer, students would arrive to undergo a similar course of instruction.¹⁹

Though the techniques and skills imparted at the school remained fairly constant, the name of the institution at which they were taught would not. In 1963, to reflect the Army’s desire that cold weather training be expanded to include entire units as well as individuals, the Cold Weather and Mountain School was renamed yet again, becoming the US Army Northern Warfare Training Center (NWTC).²⁰ As the NWTC settled into its mission, the winter curriculum expanded its emphasis on skiing, with the slopes of the Black Rapids Training Site

¹⁸ Ibid.

¹⁹ Ibid.

²⁰ “NWTC History.”

providing a forum for students to learn the “fundamentals of military downhill skiing” and “ski fighting techniques,” as well as “methods of maneuvering while adapting to high winds, blowing snow, and poor visibility.”²¹ Instructors for this portion of the training included prominent skiing experts from the 10th Mountain Division, such as downhill skiing technical advisor Peter Gabriel, and cross-country expert Hans Wagner.²² The ambitious continuing mission of the NWTC, referred to by its students as the “Cool School,” was ably summed up by its motto: “We battle cold and conquer mountains.”²³

In the battle against the cold, however, the “Cool School” was not alone. While the NWTC prepared men to face the elements, the Arctic Test Branch continued to work to provide the Army with the necessary equipment to do so. Soon after the Big Delta post became Fort Greely, the Arctic Test Branch was renamed as well, becoming the U.S. Army Arctic Test Board in 1957.²⁴ In 1962, Army reorganization brought the Arctic Test Board under the auspices of the Test and Evaluation Command (TECOM), and in 1964 it changed its name again, this time becoming the Arctic Test Center (ATC). Twelve years later, in 1976, a final redesignation made it the Cold Regions Test Center (CRTC).²⁵

Through all these iterations, testing of equipment in the cold continued in its importance. The procedures for implementing tests once the test center came under TECOM were rigorous:

First, when the Army wants to test an item and needs to see if it operates in specific conditions, documents outlining the requirements for the test are forwarded to test centers, in this case, CRTC. These documents give, among other things, a general mission profile. ‘We examine the requirements and generate an outline test plan,’ Capt.

²¹ Col. George T. Adair, “Cool School for Hot Combat: It Makes Sourdoughs out of Tenderfeet,” *Army Digest* 23 (February 1968): 32.

²² Tetra-tech, “Inventory and Evaluation,” 2-7.

²³ Adair, “Cool School for Hot Combat,” 33.

²⁴ “US Army Cold Regions Test Center: History,” <http://www.crtc.army.mil/history.html>, accessed on April 30, 2014.

²⁵ *Ibid.*

Steven Alexander, CRTC Test Officer, said. ‘This tells how the test will be conducted, the number of men needed, and projected costs. This plan is then sent to the Test and Evaluation Command, where action is taken to provide the needed resources for testing,’ he continued.

TECOM will get a formal request for the test from the materiel developer, and send CRTC a test design plan. This is an outline on how TECOM would like to test the item. ‘We write a detailed test plan that gets into the nitty-gritty of how we will go about testing the equipment,’ Alexander said. This goes to TECOM for approval. CRTC then receives a test execution directive, which is TECOM’s formal order to perform the test. When the equipment and required documentation arrives here, the manufacturer often trains the test personnel to operate the equipment. The test is ready to begin.

‘The main responsibility of a test officer is to see if the item works as it’s supposed to,’ Alexander said. ‘If an item is to function at -10 degrees, we check to make sure it does.’ Alexander says the test officer cannot afford to become biased. ‘Doing so will influence the final outcome of the tests,’ he said. CRTC’s mission is to report on the equipment’s results, not to make it achieve results.²⁶

In 1959, while still known as the Arctic Test Board, *New York Times* reporter Hanson Baldwin noted that, while the Cold Weather and Mountain School sought to lessen the mystery of the Arctic, the Test Board proudly maintained an emphasis on its Arctic mission and the extremities at which it operated.²⁷ At that time under the command of Col. D. E. Townsend, the Test Board was not a part of the ALCOM structure, rather reporting to the Material Developments Section of the Continental Army Command at Fort Monroe and ultimately to the Army’s Research and Development section in Washington.²⁸

As a part of research and development, the Test Board experimented with both new pieces of equipment and modifications to existing items to increase efficiency and performance in extreme cold. In 1959, the equipment undergoing tests ranged from something as simple as a winter trigger for a rifle that would enable a soldier to fire while wearing mittens to a new version of the Honest John field artillery rocket and launcher that would be lighter and do away

²⁶ Claude Dixon, “CRTC’s Testing Scheme Explained,” *Buffalo*, March 21, 1986, 7.

²⁷ Hanson W. Baldwin, “The Army in Alaska- II: Arctic Test Board Tries Out Arms and Equipment in Adverse Weather,” *The New York Times*, February 28, 1959, 8.

²⁸ *Ibid.*

with the necessity for an electric blanket to maintain the proper temperature for the propellant.²⁹ Tests on a Fairchild Armalight light caliber rifle had found it efficient down to sixty degrees below zero, while newly developed nickel cadmium batteries retained power in the same temperature range.³⁰

Each winter brought new items to the test facility, with the months from November to March providing the best conditions to fulfill cold weather testing. By 1962, items undergoing trials included the M-60 A-1 diesel tank, a battle tank weighing sixty tons and equipped with a 110-mm cannon, along with various classified munitions to be fired from it.³¹



Figure 1-Tanks Being Tested at ATC (Photo Courtesy Jon Dufendach)

In the infantry test section, the Test Board evaluated small arms, including a predecessor /of the M-16 known as the AR-15, putting it up against the AK-47 and the M-14. An example of the kinds of test performed was one where Test Board personnel fired the weapons through a set of magnetic rings set up approximately 10 feet apart, and when a bullet entered the first ring it

²⁹ Ibid.

³⁰ Ibid.

³¹ Jon Dufendach, telephone interview by author, April 28, 2014.

would activate a clock and when it exited the second the clock would stop, thus measuring the bullet velocities at cold temperatures.³²



Figure 2 - Ammunition Velocity Test (Photos Courtesy Jon Dufendach)

In some instances where the Army had a chance to compare the results of tests from an artificial cold weather environment such as a laboratory and the natural cold to be found at Fort Greely, the advantages of the Alaskan climate were clear. In 1972, tests of the M525 Point Detonation Fuze in a cold chamber at Pictinny Arsenal in Dover, NJ had shown an alarmingly high rate of duds (22.5%).³³ Despite being stored in a frigid environment, exposure to a warmer environment before firing was suspected to have caused a build up of frost, leading to the misfires. In the constant temperatures of Alaska, the rate of duds dropped to one out of 100, proving the superiority of testing under natural conditions.³⁴

In addition to arms and ammunition, the Test Board under its various forms of nomenclature also experimented with cold weather gear for soldiers in the Arctic. The winter of 1957 saw testers evaluating winter boots, with the standard Korean-war era model going up against a new, improved model that had “more insulation and an air relief valve on the side to

³² Ibid.

³³ “Test Completed,” *The Buffalo*, February 25, 1972, 5.

³⁴ Ibid.

equalize pressure in the inner layers when worn aloft by airborne troops.”³⁵ The importance of proper footwear in the Arctic is hard to exaggerate; so, testers took the comparison very seriously.



Figure 3- Perils of Inadequate Footwear (Photo courtesy Jon Dufendach)

Blocked for Copyright Purposes

Figure 4- Cross Section of 'Bunny' Boot (www.bunnyboot.com)

Developed by podiatrist Tom Dee of the Navy Clothing and Textile Research Laboratory in Natick, Massachusetts, “Bunny boots,” as the white boots would affectionately become known, were found to be more efficient at keeping soldier’s feet warm and were subsequently adopted for cold weather use.³⁶

³⁵ Woodman, *Duty Station Northwest*, Vol. 3, 90.

³⁶ *Ibid.*; and Dufendach Interview.

Testing of vehicles was also a major focus for the Test Board/Center. Trials ranged from a cold start laboratory for standard Army vehicles to Arctic experimentation on more exotic types of transport. Tests in the cold start lab sought to evaluate different vehicles' performance under extreme cold temperatures, and make the necessary alterations to ensure that they could be relied upon to start in any temperature.³⁷



Figure 5 – Top, Ambulance Cold Start Testing, Bottom, Cold Weather Test for Tank (Photos courtesy Jon Dufendach)

Other vehicles were less prosaic. In 1972, the only remaining surface effects vehicle (SEV) from the conflict in Vietnam, a Bell SK-5, was transported to Fort Greely for testing in an Arctic environment.³⁸ The SK-5 was essentially a hovercraft, also known as an air cushion vehicle. The SK-5's arrival at Greely and subsequent tests marked the first time an SEV was evaluated in a true Arctic environment, and the first extensive evaluation over different northern

³⁷ Dufendach Interview.

³⁸ "SEV to Be Tested Here," *The Buffalo*, January 28, 1972, 6.

terrains. The hope was that SEVs would prove a viable alternative to wheeled or tracked vehicles for navigating the rugged and unforgiving Alaskan wilderness. The SK-5 spent five months in Alaska, and was tested across a wide variety of terrains, with the test crew also responsible for evaluating the effect of the vehicle on Alaskan ecology.³⁹

Despite the variety of activities underway at the Test Center, questions still arose about whether Army cold weather readiness was sufficient. ATC commander Col. David J. Schumacher, in 1972 questioned that readiness, asserting that, in his judgement, “the US Army’s ability to conduct military operations in the cold regions of the world is far below what it should be.”⁴⁰ Schumacher advocated an expanded mission for the ATC, arguing that increased testing was needed in the intermediate cold category, which ranged to -25° F, or what would normally be encountered in Europe and North America.⁴¹

It was to combat such fears of unreadiness and to apply the lessons learned from both the NWTC and the ATC that almost yearly large-scale winter exercises took place in Alaska from the late 1950s through the 1980s. Though theaters of operations often ranged far from Fort Greely, the months leading up to the maneuvers saw many troops visit the NWTC in preparation for the exercises, and the equipment used often found its way to the ATC for further testing and improvement.⁴² During the winters of 1950-51 and 1952-53, before the post was designated Fort Greely, massive exercises involving thousands of troops took place in Alaska. The maneuver known as “Firestep” in 1951 tested the transport of airborne troops to support Alaskan defenses,

³⁹ Ibid.

⁴⁰ “Col Schumacher Comments on TECOM Conference,” *The Buffalo*, March 3, 1972, 4.

⁴¹ Ibid.

⁴² Adair, “Cool School for Hot Combat,” 33.

with American planes using Canadian bases as stop-overs on their way north.⁴³ A similar exercise the following year also “involve[d] all armed forces in the territory, paratroopers of the states-based Eleventh Airborne Division, and Tactical and Strategic Air Command planes from the states.”⁴⁴

Only a few months prior to the establishment of Fort Greely, Exercise ‘Snow Bird’ provided the largest test to date for the training and testing regimen at Big Delta, with more than 3,000 men involved in a maneuver near Talkeetna that included the “largest mass drop ever attempted in the area of the nearest invasion route from and to the Soviet Union.”⁴⁵ One important concept tested during ‘Snow Bird’ was the use of compacted snow runways, a new technique for Arctic operations. ‘Snow Bird’ sought to build upon the previous Alaskan exercises and push forward in Arctic experience.⁴⁶

The following year, however, saw Fort Greely at the center of the “longest and coldest Alaskan maneuver” attempted to date.⁴⁷ Exercise ‘Moosehorn’ dwarfed ‘Snow Bird’ in scope, involving six combat battalions from Alaskan bases, and one battalion from Fort Lewis, WA, seven thousand soldiers in all.⁴⁸ Beginning near the end of January 1956, ‘Moosehorn’ sought to “determine how well combat units could move, fight, and be supplied under extreme Arctic conditions.”⁴⁹ As a feat of supply and troop movement, it was then unequaled in Alaskan military

⁴³ “U.S. Forces to Use Canadian Bases in Alaska Exercise,” *The Montreal Gazette*, April 13, 1951, 13.

⁴⁴ “Alaska War Games Set: ‘Exercise Warm Wind’ to Provide Training in Cold Next Month,” *New York Times*, October 6, 1952, 21.

⁴⁵ Anthony Leviero, “Alaska Becomes Invasion Ground: Army-Air Force Exercise Pits 3,000 Paratroopers Against Sub-Arctic ‘Aggressor,’” *New York Times*, January 17, 1955, 8.

⁴⁶ *Ibid.*

⁴⁷ “Exercise Moosehorn,” *The Big Picture*, Archive Video (Washington, D.C.: Army Pictorial Center, 1956).

⁴⁸ *Ibid.*

⁴⁹ *Ibid.*

history, as a convoy of over 200 vehicles and more than 1,400 men traveled up the ALCAN highway to reach Delta Junction for the maneuver.⁵⁰

The convoy, which departed Fort Lewis on January 4, got behind schedule even before it reached the Canadian border due to snow in the Seattle area, and then, once into Canada, other problems arose.⁵¹ Drowsiness caused several accidents, and caused other drivers to take wrong turns in various towns along the route, while temperatures as low as -50° F made bivouacs along the ALCAN more difficult and dangerous.⁵² Canadian military observers shepherded their movements through Canada very carefully to avoid unwelcome friction with residents, but in Quesnel, BC, the town gun club presented the American unit with a record-large spread of moose antlers in honor of the exercise name.⁵³

The maneuver was to take place on undeveloped Arctic terrain south of Fort Greely, avoiding the use of the existing road net to truly test mobility in the Arctic. Once the battalion from Fort Lewis had arrived at Greely, joining the battalions from other Alaskan installations, mainly Fort Richardson near Anchorage, Maj. Gen. James F. Collins took command of the troops for the duration of the maneuver.⁵⁴ The purpose of the exercise was two-fold: first, to test the “ability of units to deliver timely and accurate fire under subarctic winter conditions,” and second, “to determine the most effective method of resupplying large combat units under adverse arctic conditions.”⁵⁵

⁵⁰ “Accidents, Miscues Mar ‘Moosehorn’ Plan,” *Cariboo Observer*, Quesnel, B.C., January 12, 1956, 1.

⁵¹ “Outline Alaskan Army Exercise,” *Ludington Daily News*, December 20, 1955, 2; and “Alcan Road, at 50 Below Zero, Gives U.S. Troops a Test,” *Chicago Tribune*, January 9, 1956, 20.

⁵² “Alcan Road”; and “Accidents, Miscues.”

⁵³ “Accidents, Miscues”; and “Trophy Presented American Army Unit,” *Cariboo Observer*, January 12, 1956, 1.

⁵⁴ “Outline Alaskan Army Exercise.”

⁵⁵ *Ibid.*; and “Exercise Moosehorn.”

Upon beginning the exercise, troops learned of the following “manuever situation: aggressor forces of unkown strength have made airborne landings north of the Alaskan range. An aggressor airborne unit has seized Delta Junction. Two battalion combat teams will immediately engage the aggressor forces and destroy them.”⁵⁶ In order to learn the most effective method of resupply, one battalion would be resupplied by air transport, and the other would receive supplies via overland transport, in order to compare and evaluate the two methods.⁵⁷ For both columns, the main need was gasoline, as the mechanized vehicles that made up the bulk of the units required an amazing amount of fuel to traverse the rough terrain. Even the most fuel efficient mechanized vehicle, the Weasel, could only get about a mile and a half per gallon, allowing a range of approximate one hundred miles per tank of fuel.⁵⁸

As the two battalions moved out on their required forty-mile trek, temperatures were below average for the area, with lows reaching -45° F and over two feet of snow blocking progress for troops. Going out in front were the trailbreaking units on cross-country skis, alternating between being pulled behind a mechanized vehicle (skijoring) and moving under their own power to keep warm.⁵⁹ For a part of the route, one battalion was able to travel on the frozen Delta River and covered an impressive nineteen miles in the first day of the exercise.⁶⁰ The ‘aggressor’ forces were encamped near the 2,400 foot Donnelly dome, an outpost of the Alaska Range. Though the battalions carried as many supplies as they could manage, after the first night’s bivouac they still needed to be resupplied. By the second morning, however, a fierce

⁵⁶ “Exercise Moosehorn.”

⁵⁷ “Outline Alaskan Army Exercise.”

⁵⁸ “Exercise Moosehorn.”

⁵⁹ Ibid.

⁶⁰ Ibid.

williwaw⁶¹ brought warmer temperatures (-20° F), but winds of up to seventy mph, thus preventing both the air drops for the first battalion and the cat train⁶² for the second battalion from leaving Fort Greely.⁶³

By the end of the second day, the williwaw had subsided, allowing for the battalions to be resupplied the following morning. The airdrop for the first battalion brought 2,000 C-rations, 2,000 assault packs, 6,800 gallons of fuel, and 14,500 lbs. of ammunition to the drop zone, thus proving the feasibility of air supply for a combat battalion during an arctic operation.⁶⁴ Moving overland, cat trains from the 271st Engineer Battalion delivered 4,000 gallons of gasoline, 2,000 C-rations, 2,000 assault packs, and 5,000 lbs. of ammunition to the second battalion, illustrating that overland supply from a not-too-distant location was also a feasible option.⁶⁵ After receiving their supplies, however, troops soon had to contend with plummeting temperatures, with lows reaching nearly -70° F.⁶⁶ Commanders attempted to strengthen their men's resolve during the frigid temps by pointing to the important place Alaskan troops held in defending the country from possible Soviet attack, with one soldier involved in the maneuver recalling being told, "You are our first line of defense."⁶⁷

As the two battalions moved closer to the 'aggressor,' the first battalion initially made contact with the 'enemy,' and the second pushed hard across the wilderness to take the 'enemy' by surprise in a flanking maneuver. As the 'aggressor' retreated and U.S. forces pursued,

⁶¹ A sudden, intense wind.

⁶² The cat trains were three 10-ton sleds pulled by bulldozers.

⁶³ Ibid.

⁶⁴ Ibid.

⁶⁵ Ibid.

⁶⁶ Universal-International News, "Army Digs in for Defense of Arctic," February 27, 1965, https://archive.org/details/1956-02-27_Army_Digs_In_for_Defense_of_Arctic, accessed April 29, 2014.

⁶⁷ Victor S. Navasky, "Democracy, at 70 Degrees Below Zero," *New York Times*, October 12, 2008, OpEd.

elements of the 57th Helicopter Evacuation Company from Fort Sam Houston, TX evacuated simulated casualties.⁶⁸ The simulated battle ended with the defeat of the ‘aggressor’ forces, and all the troops involved, a number which reached over half the men stationed in Alaska, returned to Fort Greely after a successful test of both the ability of troops to fight in severe cold conditions and of the ability to supply a large combat unit in the field during arctic weather conditions both overland and through the air.⁶⁹

As the Cold War continued, the Army continued in its mission to ensure that defense of the Arctic was not the sole responsibility of any one specialized unit, but that all Army troops were equally equipped to operate in cold weather and tropics, desert and tundra.⁷⁰ To this end, winter training exercises included troops from the Lower 48 as well as Alaskan units, thus ensuring that in the event of a Soviet attack on Alaskan bases, reinforcements from the Continental United States could operate effectively to retake them. These exercises utilized large swaths of Alaskan wilderness, both within the military reservations of Forts Wainwright (Ladd AFB until 1961, near Fairbanks), Richardson (near Anchorage), and Greely, and across uninhabited federal lands throughout the state.

In early 1959, the Army conducted Exercise Caribou Creek in the area between the towns of Talkeetna and Willow, with ‘Aggressor’ forces mimicing a move south from Fairbanks to menace bases near Anchorage.⁷¹ The US forces defending Anchorage consisted of elements of the 82nd Airborne Division from Fort Bragg, NC, who were gaining the cold weather experience

⁶⁸ Ibid.

⁶⁹ Ibid.

⁷⁰ Maj. Gen. Gilman C. Mudgett, “Caribou Creek,” *Military Review* 34, no. 5 (August 1959): 4.

⁷¹ Ibid., 3.

they would need if a legitimate Soviet threat required their presence in Alaska.⁷² Though the exercise did not take place at Greely, the fort still played a role in this maneuver, as some of the officers and NCOs who from the 82nd who were to participate received cold weather training at the Cold Weather and Mountain School prior to the arrival of the entire force.⁷³ The ten day exercise stressed again the problems of transportation, with engineers on both sides struggling to forge roads through the trackless landscape, and also brought forward the difficulty of determining positions in the wilderness.⁷⁴

Each winter exercise contributed to an ongoing narrative in which the ‘Aggressor’ force continued where the previous exercise had left off.⁷⁵ Following a setback for the Aggressor in 1960 during Exercise ‘Little Bear,’ two winters later, other units from the 82nd took part in 1961’s Exercise “Willow Freeze.”⁷⁶ An article commenting on that exercise in October of that year noted that “the United States is not the only country engaged in cold weather and mountain training. Other countries, including the Soviet Union...and Communist China have similar training programs for their armed forces.”⁷⁷ ‘Willow Freeze’ and ‘Little Bear’ both emphasized the logistical problems of supplying a mobile force in the arctic landscape, building on the experiences of Operation Moosehorn.⁷⁸

⁷² Hanson W. Baldwin, “Army in Alaska Opens Exercise: Battle Units Begin Training for Defense of Airfields in Cold Weather War,” *New York Times*, February 14, 1959, 9.

⁷³ Mudgett, “Caribou Creek,” 4.

⁷⁴ Hanson W. Baldwin, “Games in Alaska Tax Army Mettle: Exercise in Roadless Wilds Shows Need for Thorough Training and Equipping,” *New York Times*, February 20, 1959, 9.

⁷⁵ Lt. Col. Frank B. Case, “Logistic Support in Willow Freeze,” *Army Review* 41, no. 12 (December 1961): 44.

⁷⁶ Case, “Logistic Support,” 44; and Edna Atkinson, “‘Willow Freeze’ Games to Train Army Troops,” *Washington Post*, February 17, 1961, A4.

⁷⁷ “Warfare Taught at Fifty Below Zero: Army’s Alaska School Trains Men for Arctic Combat,” *New York Times*, October 29, 1961, 37.

⁷⁸ Case, “Logistic Support,” 44.

While 1960 and 1961 saw exercises that focused on logistics, 1962's 'Great Bear' brought 8,000 men to the wilderness with a different goal in mind. Headquarters for the massive exercise was at Fort Greely, and it emphasized the cold weather training of the many newcomers to Alaska and field testing of vehicles and equipment.⁷⁹ Most of the forces representing the United States in the exercise came from Fort Devens, Massachusetts, while special forces and psychological warfare troops from North Carolina were also involved.⁸⁰ According to press coverage of the exercise, it was "the most important exhibition of sabre-rattling in Alaska since the Second World War."⁸¹ South of the headquarters at Greely, a massive tent city was constructed at Tanacross to house the men involved in the maneuver, ironically on the site of an abandoned hangar and airfield that was a remnant of the Lend-Lease program. As one media observer noted, "Today, the appearance of Russian-piloted aircraft over Tanacross could be the signal to change Great Bear from war game to war."⁸²

An impressive amount of detail went into the preparation of the 'Aggressor' forces, who were said to hail from a fictitious nation, but were clearly meant to represent the Soviet Union, despite assertions from the Army that they were "creating a fictitious state, not copying a real one."⁸³ The First Battle Group, Ninth Infantry, permanently stationed in Alaska, took on the role of 'Aggressor,' and, with assistance from representatives of the Army's Aggressor Center in Kansas, some of the troops were even taught elements of Esperanto, a created language made up

⁷⁹ Jock Osler, "City Created to House Troops Massed in Giant 'Games,'" *Ottawa Citizen*, February 13, 1962, 13; and Hanson W. Baldwin, "Wilderness Wins Arctic War Game: Cold-Weather Maneuver by Army Ends in Alaska," *New York Times*, 19.

⁸⁰ Jock Osler, "Men's Thoughts Turn to Comforts of Home," *Ottawa Citizen*, February 22, 1962, 13.

⁸¹ Jock Osler, "8,000 Troops Rattle Sabres in Alaska," *Ottawa Citizen*, February 12, 1962, 1.

⁸² Osler, "City Created."

⁸³ Jock Osler, "U.S. 'Aggressor' Troops Are Playing It Mean," *Ottawa Citizen*, February 14, 1962, 56.

of French, Spanish, German, and Italian, in order to test the U.S. forces prisoner of war skills.⁸⁴ The ‘Aggressor’ forces also subjected their ‘enemy’ to “leaflets, radio broadcasts, and other types of psychological persuaders.”⁸⁵

In addition to the main exercise area, where U.S. forces experienced difficulties with supply that handicapped their ability to move forward, Great Bear also saw the first participation of Canadian troops in a joint Alaskan exercise since Yukon in 1948.⁸⁶ The Canadian contribution to Great Bear consisted of 150 men from Company “A” of Princess Patricia’s Canadian Light Infantry second battalion.⁸⁷ Their main task was far removed from the rest of the exercise, as they were charged with liberating the town of Nome, just 140 miles from the Soviet Union, from an ‘Aggressor’ force that captured it. Despite some setbacks due to weather, which prevented the paratroopers from dropping in as planned, the Canadians successfully landed at the airport and freed the citizens of Nome from the invading ‘enemy.’⁸⁸ The purpose of this part of the exercise was, according to one officer, “to show the people over there (Russia) that we are capable of having tactical operations in that part of the world.”⁸⁹

In the main exercise zone southeast of Fort Greely, some items being evaluated proved promising, while others left something to be desired.⁹⁰ Use of the Army’s new quick-serve meal by thousands of troops revealed a significant obstacle to use in the Arctic: each meal required up to seven quarts of water to prepare, far too much to be easily obtained from melted snow, the

⁸⁴ Ibid.

⁸⁵ Ibid.

⁸⁶ Jock Osler, “Troops in Alaska Happy--Complaining,” *Ottawa Citizen*, February 15, 1962, 42; and “Lone Canadian Covers Coldest War Exercise,” *Ottawa Citizen*, February 10, 1962, 1.

⁸⁷ Jock Osler, “Weather Stops ‘Jump’ by Canadians,” *Ottawa Citizen*, February 16, 1962, 22.

⁸⁸ Jock Osler, “Weather Clips Wings of Canadian Invaders,” *Ottawa Citizen*, February 19, 1962, 19.

⁸⁹ Osler, “8,000 Troops Rattle Sabres,” 1.

⁹⁰ Baldwin, “Wilderness Wins.”

main water source for troops in the wild.⁹¹ Several experimental Army vehicles that used methods such as pneumatic bags or oversized tires to counter the difficulties of Arctic travel proved less than effective, while tests of the Canadian “Nodwell” vehicles that utilized tracks were well received.⁹² General J. H. Michaelis, commanding general USARAL, noted the importance of determining the most efficient vehicles for use in difficult terrain, stating, “The key and important thing about Great Bear is that 60 percent of the Eurasian land mass is of similar climate, temperature, and terrain to here.”⁹³ Overall, the tests provided the Army with extensive information that could then be further refined at the Arctic Test Board/Center.⁹⁴

The following year again saw 8,000 men involved in Exercise ‘Timber Line’ descend on Fort Greely.⁹⁵ The 1963 winter exercise was intended to prepare U.S. and some Canadian troops “to operate on a nuclear battlefield in a primitive northern area.”⁹⁶ The introduction of tactical nuclear weapons to the simulated Alaskan battlefield continued the following year in Exercise ‘Polar Siege,’ an even larger maneuver that involved 10,000 troops, including a company from Princess Patricia’s Canadian Light Infantry, which had already seen one company take part in ‘Great Bear.’⁹⁷ Polar Siege provided troops with a highly realistic battlefield experience, with the USARAL commander commenting that “there was only one fundamental difference between...Polar Siege and Korea: no one was getting shot.”⁹⁸ One other difference emerged, as

⁹¹ Ibid.; and Jock Osler, “Steak on Ice not Too Bad,” *Ottawa Citizen*, February 20, 1962, 10.

⁹² Baldwin, “Wilderness Wins.”

⁹³ Jock Osler, “Vehicles Are Key in Snow,” *Ottawa Citizen*, February 21, 1962, 22.

⁹⁴ Baldwin, “Wilderness Wins.”

⁹⁵ “Looking Back—Feb. 9, 2013,” *Fairbanks News-Miner*, February 9, 2013, http://www.newsminer.com/news/local_news/looking-back-feb/article_a3125a24-7284-11e2-8277-001a4bcf6878.html, accessed May 19, 2014.

⁹⁶ “USARO Personnel Study Requirements in Alaska,” *Army Research and Development Magazine* 4, no. 3 (March 1963): 9.

⁹⁷ Woodman, *Duty Station Northwest*, Vol. 3, 97.

⁹⁸ Ibid.

the exercise ended when the “friendly forces” defeated the Aggressor with several simulated nuclear blasts.⁹⁹

The annual exercises continued in 1965, and in February Fort Greely again received troops and aircraft participating in Exercise ‘Polar Strike.’¹⁰⁰ Involving nearly 14,000 Canadian and American troops, Polar Strike was the largest maneuver held in Alaska up to that point.¹⁰¹ The goal of Polar Strike was to reevaluate the plans for “reinforcement of the Alaskan Command by elements of the U.S. Strike Command, and for continued operations in Alaska.”¹⁰² The pattern of massive yearly winter exercises, however, was broken in 1966.¹⁰³ While Elmendorf Air Force Base near Anchorage saw a massive increase in traffic as a staging area for troops and supplies heading to the escalating conflict in Vietnam, the rest of Alaska saw its level of importance decrease.¹⁰⁴ The exercise planned for February 1966 “was called off because troops originally committed are either in Vietnam, or being trained to go there while assault transports and MAC planes are tied up. Insufficient forces for profitable exercises were available.”¹⁰⁵ An indicator of the importance the Army attributed to the winter maneuvers in Alaska, however, can be seen in the fact that, despite troop commitments in Southeast Asia, a smaller scale exercise, named ‘Frontier Assault,’ took place in 1967, with its headquarters at Fort Greely.¹⁰⁶

⁹⁹ “Troops Quit Fairbanks,” *Washington Post*, February 12, 1964, A2.

¹⁰⁰ “TAC Aircraft Participate in Exercise Polar Strike,” *The Sumter Daily Item*, February 3, 1965, 2B.

¹⁰¹ Woodman, *Duty Station Northwest*, Vol. 3, 97.

¹⁰² “Polar Strike Exercise Set for Alaska,” *Reading Eagle*, December 17, 1964, 20.

¹⁰³ Woodman, *Duty Station Northwest*, Vol. 3, 97.

¹⁰⁴ C. L. Sulzberger, “Foreign Affairs: Cold Comfort in the North,” *New York Times*, May 22, 1966, 216.

¹⁰⁵ *Ibid.*

¹⁰⁶ Office of History, Elmendorf AFB, “Remembering Our Heritage, Jan 21-27,” <http://www.alaskawingcaf.org/Alaska%20Heritage/January21-27.pdf>, accessed May 19, 2014.

Even during the Vietnam War, similar exercises continued to refine and reinforce the lessons for cold weather combat learned through experience since Exercise Yukon in 1948. Exercises Acid Test I and Acid Test III (Acid Test II was cancelled) in 1969 and 1970 went forward, and Acid Test III saw Canadian paratroopers drop onto Fort Greely as part of the exercise that involved 4,700 men.¹⁰⁷ Though Alaskan exercises between 1971 and 1975 focused on the scenario of a downed aircraft traveling along the polar route, in 1975, training on a pre-Vietnam War scale resumed in January 1975 with Exercise Jack Frost, which involved over 8,000 American and Canadian troops.¹⁰⁸ The supply of creative exercise names had apparently been exhausted, as exercises in subsequent years were known as Jack Frost 76, Jack Frost 77, and Jack Frost 79.¹⁰⁹

Fort Greely's role as a site for large training exercises continued into the 1980s, with large scale maneuvers named 'Brim Frost' taking place in 1983 and 1985. These events saw hundreds of extra troops accommodated at Greely, with operations taking place in the surrounding wilderness areas.¹¹⁰ These exercises, in conjunction with the continuing activities of the NWTC and the CRTC, allowed Fort Greely to play a pivotal part in maintaining the Army's readiness to fight in cold weather, a function that an ever-present fear of a conflict with the Soviet Union made especially vital.

¹⁰⁷ Woodman, *Duty Station Northwest*, Vol. 3, 97; and *The White Sands Missile Ranger*, January 8, 1971, 1.

¹⁰⁸ Woodman, *Duty Station Northwest*, Vol. 3, 97; and Office of History, Elmendorf AFB, "Remembering Our Heritage 7-13 January," <http://www.alaskawingcaf.org/Alaska%20Heritage/January7-13.pdf>, accessed May 19, 2014.

¹⁰⁹ Woodman, *Duty Station Northwest*, Vol. 3, 97.

¹¹⁰ Spc. Thom Cuddy, "Troops Prepare for Brim Frost 'War,'" *Buffalo*, January 28, 1983, 4; and Craig Staley, "Troops Arrive for Brim Frost '85," *Buffalo*, January 18, 1985, 1.

Chapter 4 - Cold War Science at Fort Greely

Fort Greely's main contributions to the Cold War came in the realm of training and testing, but the fort was also the site of several significant projects that integrated national defense with significant scientific developments. The rationale for choosing Greely for these projects differed in each case, but ultimately its location and remoteness figured heavily into the decisions. First, Fort Greely was the home for the first field test site in the Army's Nuclear Power Program, as part of "the Cold War theme of nuclear energy for weapons and peaceful uses."¹ In keeping with that theme, the Donnelly Flats area of the Fort Greely Air Drop and Testing Area was the site for part of the nation's first satellite missile warning system in response to fears of Soviet ICBM capabilities.² Though fears of nuclear attack dominated the Cold War mindset, the Army also remained concerned over the possibility of Soviet deployment of chemical and biological weapons, and throughout the late 1960s the ATC employed the Gerstle River Test Site to conduct tests on various chemical and biological agents.³ These very different activities serve to further highlight the Cold War context in which Fort Greely existed.

One of the most visible areas of Cold War scientific development was in the realm of nuclear technology. The destructive power of nuclear weapons contrasted with the incredible possibilities for advancement promised by the splitting of the atom. Even as he was announcing the use of the atomic bomb against Japan on August 6, 1945, President Harry Truman alluded to the constructive possibilities that nuclear research provided.⁴ For the Army, a new source for

¹ Denfeld, *The Cold War in Alaska*, 282.

² Kathy Price, *Tracking the Unthinkable: The Donnelly Flats MIDAS Ground Station and the Early Development of Space Warning Systems, 1959-1967* (Fort Collins, CO: Center for Environmental Management of Military Lands, Colorado State University, 2006), 29.

³ Albert J. Mauroni, *Chemical and Biological Warfare: A Reference Handbook* (Santa Barbara, CA: ABC-CLIO, 2007): 38.

⁴ White House Press Release (August 6, 1945), *New York Times*, August 7, 1945, 4.

power was especially important, given the increasing number of complex systems for communication and data processing being produced, and the concomitant “increased dependence on electric power.”⁵ Research into the non-combat application of nuclear energy by the Army, however, did not begin until six years later, when the establishment of the Army Office of Research and Development allowed work to begin on the development of the Army Nuclear Program. Colonel James Lampert, appointed as head of that program in August 1952, worked to gain funding for the development of mobile reactors that would be able to produce electricity for remote bases.⁶ No progress could occur, however, without approval from the Atomic Energy Commission (AEC), as the Atomic Energy Act gave responsibility for and control over research and development in the nuclear field to the AEC.⁷

As both head of the Army program and liaison to the AEC, Lampert faced some significant hurdles to receiving the necessary funding. Resistance within the AEC to his proposals largely stemmed from the fact that the Army could not demonstrate “a formal requirement for a nuclear power plant, and the Commission was very reluctant to allocate funds without such a justification.”⁸ To satisfy this shortcoming, Lampert and his assistant, Captain William B. Taylor, made an examination of remote bases in Alaska and Greenland to compare the cost of building a nuclear power plant with the cost of fuel deliveries for conventional power generation, and concluded that the long term savings on fuel and delivery costs provided a rationale for the development of nuclear power plants for the Army.⁹

⁵ U. S. Army Engineer Reactors Group, “An Introduction to the Army Nuclear Power Program,” (Fort Belvoir, VA, March 1970), 1.

⁶ Lawrence H. Suid, *The Army’s Nuclear Power Program: The Evolution of a Support Agency* (New York: Greenwood Press, 1990), 3, 8.

⁷ “Introduction to the Army Nuclear Power Program,” 1.

⁸ *Ibid.*, 10.

⁹ *Ibid.*, 11-12.

Even when presented with this finding and an open-ended proposal that indicated that the Army was prepared to accept any scenario for control over and funding for the program that the AEC deemed appropriate, the AEC still rejected the Army's proposal, due in part to the AEC's desire to prevent Army competition with the nascent commercial nuclear power industry.¹⁰ Despite this setback, the Commission did allow research on the small reactors that would be required for the Army's proposal to proceed, and the uncertain future of atomic policy left hope for a different decision in the near future.¹¹ At the Oak Ridge National Laboratory, director Dr. Alvin Weinberg was a strong supporter of nuclear power plants, and under his authority, the laboratory became, "in effect, a technical consultant to Lampert and the Army's Nuclear Power Program."¹²

Prospects for the Army Nuclear Program improved dramatically when Admiral Lewis Strauss, adviser to President Eisenhower on energy matters and staunch supporter of the Army's proposals, was nominated Chairman of the AEC on June 24, 1953.¹³ In a move destined to further smooth the path for Army nuclear power, the new chairman appointed the head of the Army's Office of Research and Development, General Kenneth D. Nichols, to the post of General Manager of the AEC, effective November 1.¹⁴ Before taking up his new post, Nichols endorsed the Nuclear Power Division's recommendation that "the Army support the design of a prototype nuclear power plant that would produce about 1,000 kilowatts of electrical power and

¹⁰ Ibid., 12-13.

¹¹ Ibid., 13.

¹² Ibid., 15.

¹³ Ibid.; and "Lewis Strauss to Become Head of AEC," *The Washington Post*, June 25, 1953, 4.

¹⁴ "GEN. NICHOLS GETS HIGH ATOMIC POST: Army Expert in Field Named Manager to Succeed Boyer—Drops Military Duty," *New York Times*, October 2, 1953, 16.

sufficient additional steam to heat an arctic installation having a 200-man garrison.”¹⁵ In his estimation, the validation for the program lay “in the fact that 75% of the total logistic support required for such a station would be eliminated by the use of a nuclear power plant.” The savings, he argued, would not be as significant in peacetime, but “in time of all-out-war, dollar savings and the assurance of continued operations without dependence on regular deliveries of oil would be an important justification.”¹⁶

The Nuclear Power Division, headed by Col. Lampert, produced a report in accordance with Nichols’ ideas which proposed that the Army build two nuclear power plants: the first a prototype in the United States that should cost less than \$5 million, and the second a field unit to be located in the arctic and completed by late 1958.¹⁷ Unsurprisingly, the first obstacle to reappear was the question of funding, as the DOD assumed the AEC would provide the budget, while the AEC asserted that it had no funds available and indicated its expectation that the Army would finance the necessary projects.¹⁸ The determination of both sides to move forward with the project, however, smoothed the way, and on July 21, 1954, the DOD and the AEC reached an agreement on joint funding under which “the AEC agreed to pay for the cost of the reactor and associated equipment, with the Army paying for the cost of the conventional portions of the plant.”¹⁹

Col. Lampert decided that the first prototype should not be located in a remote area, due to the untested nature of the technology, and the first Army nuclear reactor was instead

¹⁵ Suid, *The Army’s Nuclear Power Program*, 16.

¹⁶ *Ibid.*

¹⁷ *Ibid.*, 19.

¹⁸ *Ibid.*, 20.

¹⁹ *Ibid.*, 24.

constructed at Fort Belvoir, Virginia.²⁰ The construction contract was awarded to ALCO Products in December 1954, and construction began in October 1955 with an anticipated completion date in early 1957.²¹ The first electricity at the plant was produced on April 15, 1957, and the plant became “one of the first reactor systems in the United States to supply power to an electrical grid.”²² In addition to testing the prototype reactor for the Army Nuclear Power Program, this reactor, designated SM-1 (S- Stationary, M- Medium power range, 1- First of its kind), provided a training ground for Army nuclear technicians as the program expanded.²³

The first expansion of the program was made official on December 18, 1957, when the Army announced that it had authorized construction of the program’s first field reactor at Fort Greely.²⁴ The choice of Fort Greely, however, had been made soon after the construction contract for the Fort Belvoir prototype was awarded. In early 1955, the Army Reactor Branch chose Greely because it would “satisfy military requirements for electricity and heat with logistic efforts greatly reduced relative to existing conventional systems.”²⁵ In addition, a reactor at Fort Greely would also “serve as a transitional test facility to gain operational experience under conditions of extreme temperature (+90 degrees to -60 degrees) in order to evaluate the nuclear power concept under arctic field conditions,” and thus would provide data that would “complement rather than duplicate that gained from the Fort Belvoir plant.”²⁶

The Army’s initial plan for the reactor at Fort Greely called for construction to begin in 1957, but the proposal met with some questions from the Bureau of the Budget regarding

²⁰ Ibid.; and “Introduction to the Army Nuclear Power Program,” 20.

²¹ “Work Begins at Belvoir on Atomic Power Plant,” *The Washington Post*, October 26, 1955, 10.

²² “Introduction to the Army Nuclear Power Program,” 20.

²³ Ibid.

²⁴ “Alaskan Fort to Get Atomic Power Plant,” *The Washington Post*, December 19, 1957, 3.

²⁵ Suid, *The Army’s Nuclear Power Program*, 42.

²⁶ Ibid.

coordination with the AEC and the military necessity of a nuclear power plant at Greely.²⁷ This delayed the timeline for the project, and after the initial delay, other obstacles arose. The Office of Assistant Secretary of Defense (Research and Development) questioned the necessity of building a reactor at both Fort Greely and a site that the Air Force had proposed, the air station at Sparrevohn, Alaska.²⁸ The Air Force could demonstrate a much more pressing need for a nuclear power plant, as all fuel to generate electricity for the extremely isolated base had to be brought in by air, a process made dangerous by a short runway.²⁹ Col. Lampert acknowledged the Air Force's need, but argued that the relative accessibility of Fort Greely was a point in its favor, for, though it was not an economic necessity, it was preferable to have the first field reactor at a site that was not only accessible by air in case of unforeseen difficulties.³⁰

In addition to uncertainty in Washington, the USARAL Commander opposed the project, feeling that including it in his budget would take funding away from other areas in Alaska. By including funding for the plant in the Corps of Engineers budget rather than the USARAL budget, the Chief of Engineers avoided that issue, and in June 1957, the project finally received approval from the Defense Department.³¹ The project was sent out for bids among construction firms experienced with the Alaskan environment, and on April 26, 1958, Peter Kiewit Sons' Construction Company out of Seattle received the contract to build the plant for \$4,897,217.³² Kiewit then subcontracted the nuclear components of the plant to ALCO Products, the same company that had created the design for both the Greely plant and the SM-1 at Fort Belvoir.³³

²⁷ Ibid.

²⁸ Ibid., 48-49.

²⁹ Ibid.

³⁰ Ibid.

³¹ Ibid., 50.

³² Ibid., "Fort Greely Power Plant," *Alaska Construction & Oil* 20, no. 8 (August 1979): 4.

³³ Suid, *The Army's Nuclear Power Program*, 50.

Construction began at Fort Greely in June 1958, but the short summer season only allowed a small percentage of the work to be completed before winter came, and work had to be suspended. Significant progress was made when work began again in the spring of 1959, but in the middle of the construction season, an Alaska-wide strike of all construction workers and craftsmen brought work on the plant to a standstill. No resolution came until mid-September, too late for work to resume that year, and the project was pushed an entire year behind schedule.³⁴

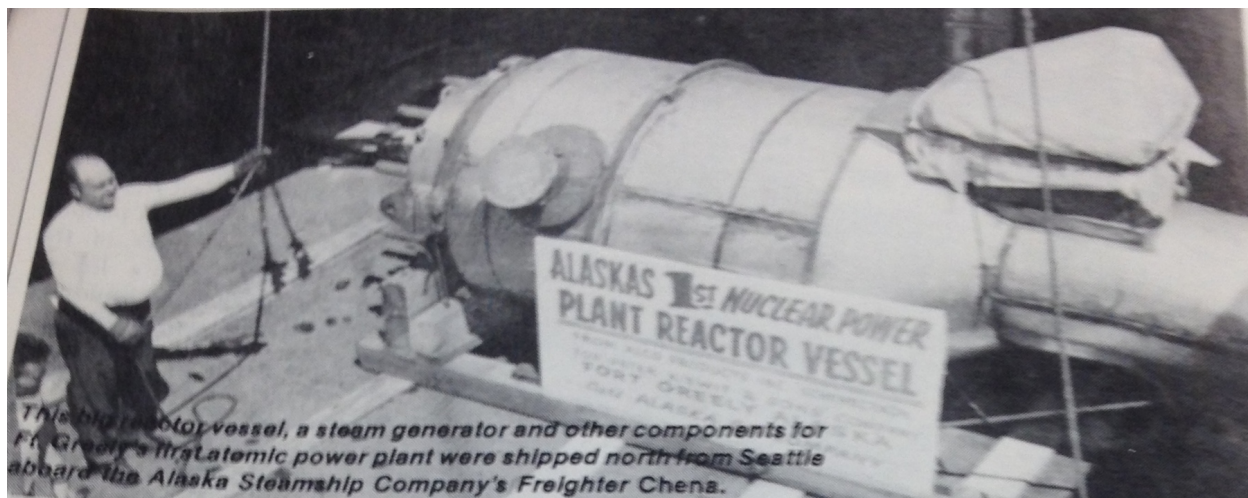


Figure 1- Reactor Vessel³⁵

Complicating the construction schedule was the complexity of transportation, with major components of the reactor arriving via ship to the port of Valdez, while other construction materials made the long trek up the Alcan Highway to reach Fort Greely. Even once the building was completed, problems with various delicate technical systems continued to delay the project.³⁶

³⁴ Ibid., 52; "Delta Construction Increases," *Delta Midnight Sun*, January 24, 1959, 1.

³⁵ "Fort Greely Power Plant," *Alaska Construction & Oil*, 4.

³⁶ Suid, *The Army's Nuclear Power Program*, 52-53.

It was not until March 13, 1962 at 12:38 AM that the SM-1A reactor at Fort Greely finally reached criticality.³⁷ Before the plant could fulfill its mission to produce 4,000 kilowatts of energy, 2,000 of which would go to producing electricity and 2,000 to heat for the base, it first was subjected to an intense round of tests.³⁸ Those tests continued for nearly a month and a half, ensuring that both the reactor and the steam system that would operate the turbines for generating electricity were functioning properly.³⁹ Once the tests were complete, the reactor would provide “nearly all the power Fort Greely use[d] during the winter months,” according to Major Richard Harris, Officer in Charge of the reactor.⁴⁰ The reactor began producing electricity for the fort on April 23, 1962, and soon, the Fort Greely power plant had an opportunity to supply power to the local community as well when vandals damaged the local power system.⁴¹

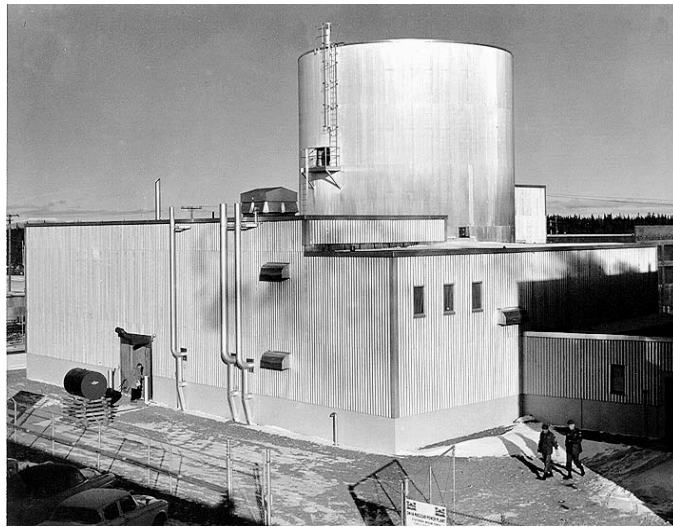


Figure 2- SM-1A Power Plant at Fort Greely⁴²

³⁷ “Fort Greely Nuclear Power Plant Goes Critical,” *Delta Midnight Sun*, March 16, 1962, 1. “Criticality is the point at which the nuclear reaction becomes self-sustaining.” Luther W. Hardee, message to author, May 26, 2014.

³⁸ *Ibid.*

³⁹ “Nuclear Power Plant Tests Continue,” *Delta Midnight Sun*, March 23, 1962, 1.

⁴⁰ *Ibid.*

⁴¹ Suid, *The Army’s Nuclear Power Program*, 53; and “GVEA Explains Power Failure,” *Delta Midnight Sun*, June 15, 1962, 6.

⁴² <http://en.wikipedia.org/wiki/File:SM1Anuclearpowerplant.JPG>

Though the first years of operation involved some minor issues, it was, by and large, a reliable source of heat and power for the base for the next ten years, also stepping in to provide power for local Golden Valley Electric Association customers whenever the vagaries of Alaskan weather, including the very high winds that are characteristic of the Delta Junction area, caused disruptions in power service.⁴³ A problem discovered in 1967 came close to causing the premature shutdown of the plant, but instead led to an important advance for the nuclear industry. Radiation from the core had caused the metal of the pressure vessel to become brittle, but the Army's R & D program discovered that annealing the steel would counteract the problem, a new technique that would have implications for the rest of the industry.⁴⁴

Though the annealing of the reactor vessel and the installation of a new steam generator in 1969 extended the life of the plant, changes were in store that would spell the end for it and the Army Nuclear Power Program as a whole. By the late 1960s, the program had achieved most of its goals. It had successfully developed and operated both prototypes and field plants, including a barge-mounted reactor for the Panama Canal Zone.⁴⁵ The Vietnam War, however, changed funding priorities, and the reactor development program was a victim. "The first setback occurred in 1968 when funds were not authorized for the continuation of the ML-1 [Mobile,

⁴³ "Greely Providing Power," *Delta Midnight Sun*, February 10, 1972, 1.

⁴⁴ Suid, *The Army's Nuclear Power Program*, 102. "The reactor pressure vessel is a large cylindrical steel vessel designed to hold the core of a nuclear power plant; it is designed with thick steel walls to be able to withstand the very high heat and pressure that occur inside as well as to prevent the leakage of any of the cooling liquid that flows through the reactor." Annealing is "the process of heating and cooling metal to remove defects in the metal's structure." Luther W. Hardee, email to the author, May 22, 2014.

⁴⁵ R. J. Fasnacht et al., *U.S. Army Corps of Engineers SM-1A Nuclear Power Plant Historical Summary*, Halliburton NUS Environmental Corporation and U.S. Army Corps of Engineers, December 21, 1992, 1-2.

Low-Power, 1] development. This marked the beginning of the curtailment of program funding.”⁴⁶

By late 1970, “the Chief of Engineers decided that the SM-1A had successfully completed its mission of demonstrating the feasibility of building and operating a nuclear power plant in a remote, arctic environment.”⁴⁷ Therefore, “as part of the reduction of nonessential activities,” in late 1971, the Chief of Engineers ordered the permanent shutdown and decommissioning of the plant, to take place no later than the scheduled depletion of the reactor’s fourth fuel core in 1973.⁴⁸ The decommissioning began on March 14, 1972 after the plant was shut down for the last time. The decommissioning process involved the removal of the nuclear materials and equipments, and the entombment of the reactor vessel in concrete and grout.⁴⁹ The experiment had been a success, and the SM-1A reactor at Fort Greely had been “important in Army testing of small nuclear power plants” and in forwarding the technology for extending the life of nuclear power plants.⁵⁰

As promising as the peaceful use of nuclear technology seemed for the future of the Army in the 1950s, the very real threat posed by nuclear weapons was an overwhelming concern for the Army and Air Force. From the beginning, Alaska received significant attention from planners concerned with providing as much advance warning of a potential attack as was possible. While the primary delivery method for a nuclear attack was still via bombers, construction began in Alaska on the Distant Early Warning (DEW) Line, a series of highly advanced radar and communication stations that stretched across the northern coastline of Alaska

⁴⁶ Ibid.

⁴⁷ Suid, *The Army’s Nuclear Power Program*, 111.

⁴⁸ Ibid., 112; and Fasnacht, et. al., *SM-1A Historical Summary*, 1-3.

⁴⁹ Suid, *The Army’s Nuclear Power Program*, 112; and Fasnacht, et. al., *SM-1A Historical Summary*, 1-4.

⁵⁰ Denfeld, *The Cold War in Alaska*, 282; and Fasnacht, et. al., *SM-1A Historical Summary*, 1-3.

and Canada to detect any Soviet attack before it even reached North America.⁵¹ Completely operational by 1957, the DEW Line would prove inadequate almost as soon as it was completed, as rapidly advancing ballistic missile technology dramatically shortened the amount of warning the system could provide.⁵²

The Ballistic Missile Early Warning System (BMEWS), consisting of three large, ground based radars in Alaska, Greenland, and England, was the U.S. response to the launch of *Sputnik* in 1957.⁵³ Though this system was stronger than the DEW Line, a missile launched from the Soviet Union would hit its target in only thirty minutes, placing a premium on advance warning of any launch.⁵⁴ As early as 1948, a group of researchers at the Naval Research Laboratory were investigating the possibility of detecting the infrared radiation given off by missiles at launch and during flight.⁵⁵ By 1955, William Kellog and Sidney Passman of the Rand Corporation, under contract with the Air Force, had produced a paper investigating the possible application of infrared missile detection to a satellite missile warning system.⁵⁶

In 1956, the Air Force tasked the Lockheed corporation with building a photographic reconnaissance satellite, and Lockheed proposed further military applications of satellite technology, including a proposal “for a constellation of accurately positioned polar orbiting satellites, which would sweep over the vast Sino-Soviet land mass and instantly report any

⁵¹ Denfeld, *Cold War in Alaska*, 22-26.

⁵² Jeffrey T. Richelson, *America's Space Sentinels: DSP Satellites and National Security* (Lawrence, KS: University Press of Kansas, 1999), 7.

⁵³ *Ibid.*

⁵⁴ *Ibid.*

⁵⁵ J. A. Curcio and J. A. Sanderson, *Further Investigations of the Radiation from Rocket Flames*, Report No. N-3327 (Washington, D.C: Naval Research Laboratory, 1948), 1, <http://www2.gwu.edu/~nsarchiv/NSAEBB/NSAEBB235/01.pdf>, accessed May 19, 2014.

⁵⁶ William Kellog and Sidney Passman, *Infrared Techniques Applied to the Detection and Interception of Intercontinental Ballistic Missiles*, RM-1572 (Santa Monica, CA: RAND, 1955), ii, <http://www2.gwu.edu/~nsarchiv/NSAEBB/NSAEBB235/02.pdf>, accessed May 19, 2014.

detection of missile launches to one of three strategically located ground stations.”⁵⁷ This idea was highly attractive to the Air Force, and “as a result, before the end of 1957, Lockheed’s proposal became Subsystem G of Weapons System 117L (WS-117L), the overall Defense Department space-based reconnaissance and surveillance program.”⁵⁸ By November 5, 1958, Subsystem G, which had come under the responsibility of the Advanced Research Projects Agency (ARPA), was decreed to become an independent project.⁵⁹ The public first received notice of the proposed system when the ARPA director announced it at a press conference on December 3, 1958, giving it the name “Missile Defense Alarm System,” or “MIDAS.”⁶⁰

In March 1959, a report from the President’s Science Advisory Committee looked favorably on the BMEWS and infrared detection via U2 flights, but balked at the cost of construction of MIDAS and advised that there was “insufficient evidence concerning the implementation of such a system to justify its construction at this time.”⁶¹ Despite the official hesitancy, construction began on the ground stations that would receive data from the satellites once they were in orbit in 1959.⁶² Since MIDAS was intended to complement the BMEWS, the three ground stations were to be located near the BMEWS radar stations. While the station in Greenland was placed at the same location as the radar site, the Alaskan Donnelly Flats site was approximately 100 miles east of the BMEWS radar station at Clear, Alaska.⁶³

⁵⁷ Richelson, *America’s Space Sentinels*, 8.

⁵⁸ *Ibid.*, 9.

⁵⁹ *Ibid.*, 12.

⁶⁰ Edward Gamarekian, “New Project Aims Also at Developing Manned Vehicle: U.S. to Launch Huge Satellites,” *Washington Post*, December 4, 1958, A1.

⁶¹ President’s Science Advisory Committee, *Report of the Early Warning Panel*, March 13, 1959, 11, <http://www2.gwu.edu/~nsarchiv/NSAEBB/NSAEBB235/03.pdf>, accessed May 20, 2014.

⁶² Price, *Tracking the Unthinkable*, 29.

⁶³ *Ibid.*, 30.

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Figure 3- Map of Fort Greely area⁶⁴

Apparent factors behind the choice to locate the Alaskan ground station on the Fort Greely reservation included distance from the Soviet Union (at least 600 nautical miles was required), and access to communications networks. Most important, though, was complete isolation from electrical signal interference.⁶⁵ The Donnelly Flats site combined sufficient freedom from interference with access to the military communications network in the form of a concurrently constructed BMEWS Rearward Communications site in the area and ease of support due to close proximity to the road and rail networks and the existing military infrastructure of Fort Greely.⁶⁶ To ensure a lack of electrical interference, the Air Force had the

⁶⁴ Price, *Tracking the Unthinkable*, 27.

⁶⁵ Ibid.

⁶⁶ Ibid., 31.

Bureau of Land Management cancel the land claims of four Alaskans for property near the site, and ensure that no further claims could be filed in the area.⁶⁷

Though MIDAS was an Air Force project, the Army Corps of Engineers had responsibility for the details of the Alaskan section of the undertaking, and they chose the site and undertook construction. In contrast to the foot-dragging in Washington over the proposal, progress in Alaska was surprisingly rapid. “The Air Force contacted the Alaska District of the Corps of Engineers on April 10, 1959. Initial site selection was complete by April 29th. Facility design began on May 18, site surveys were done by June 1, and design review was complete by June 27. The project went out for bid on July 2, within ninety days of initiation.”⁶⁸ Work on the technical facilities in the summer of 1959, and contractors managed to get the site prepared and foundations under way before winter forced a halt to construction.⁶⁹ Once it resumed in the spring of 1960, it ran smoothly until it was completed in October of the same year.⁷⁰

While Alaskan contractors worked feverishly to complete the ground support facilities for MIDAS, scientists were also hard at work, attempting to launch the satellites that were the essential part of the program. The first attempt on February 26, 1960 failed, with media reporting, “A blazing Atlas missile boosted the 2¼ ton Midas satellite into position for a low-flying orbit, but the second stage did not separate and the entire assembly was consumed by friction heat as it dived back into the atmosphere 2,500 miles down range.”⁷¹ In May, the launch of MIDAS 2 was successful, and the satellite settled into an equatorial orbit soon after liftoff.⁷²

⁶⁷ Ibid., 30.

⁶⁸ Ibid., 31.

⁶⁹ Ibid., 32.

⁷⁰ Ibid.

⁷¹ “U.S. ‘Spy in the Sky’ Satellite Fails to Orbit,” *Chicago Daily Tribune*, February 27, 1960, 2.

⁷² Howard Benedict, “U.S. Warning Satellite Is in Orbit: Midas Tests Plan to Nip an Attack, 2 ½ Ton Scanning Probe Sends Data; Path Avoids Russia,” *Washington Post*, May 25, 1960, A1.

The Air Force planned to test the ability of the infrared sensors to detect a missile's heat signature by launching a Titan ICBM while the MIDAS satellite was in orbit, but after two days, the satellite's communications link failed.⁷³

Technical problems continued to plague the program, but the perceived threat of the Soviet Union's growing ICBM fleet caused NORAD and the Air Defense Command to urge the acceleration of the MIDAS program.⁷⁴ The two days of successful communication from orbit proved that "infrared radiation could be detected at sufficient distances by the sensors, for while the satellite tumbled it picked up a variety of infrared returns, including stellar returns."⁷⁵ Questions persisted within the defense community, however, about the ability of the infrared sensors to differentiate between the radiation from an actual missile launch and background stellar radiation, as well as "natural infrared anomalies such as volcanoes, forest fires, and the reflection of sunlight on clouds."⁷⁶

The continued difficulties, as well as the formidable cost of the program led to high level debates over whether MIDAS should continue on a path toward full implementation as planned, or if its operational date should be indefinitely delayed pending significant progress in research and development.⁷⁷ MIDAS 3 reached orbit successfully in July 1961, and it became the first MIDAS satellite to pass over Soviet territory on its second orbit.⁷⁸ The transmitting equipment, however, again failed soon after launch, and in 1962, Secretary of Defense Robert McNamara

⁷³ Richelson, *America's Space Sentinels*, 15.

⁷⁴ *Ibid.*, 16.

⁷⁵ *Ibid.*, 15.

⁷⁶ Price, *Tracking the Unthinkable*, 13.

⁷⁷ DDR&E Ad Hoc Group, *Report on MIDAS (Draft)*, November 1, 1961, <http://www2.gwu.edu/~nsarchiv/NSAEBB/NSAEBB235/04.pdf>, accessed May 20, 2014.

⁷⁸ John W. Finney, "Air Force Orbits Satellite to Spot Enemy Missiles: Midas Rocket Detector to Be Forerunner of System to Give Attack Warning: TIROS is Launched Also, Weather Scanner Is Sending Cloud Pictures—Both Will Pass over Soviet Union," *New York Times*, July 13, 1961, 1.

“directed the Air Force to reconfigure MIDAS as a research and development program. Instead of following its planned progression from an experimental to an active warning system, MIDAS would test concepts and system improvements but would not become operational.”⁷⁹

This official designation of MIDAS as an R & D program was soon followed by several highly successful launches in 1963. The May 9 launch of MIDAS 7 provided significant positive results, including successful detection of POLARIS, MINUTEMAN, and TITAN missiles launched by the Air Force to coincide with the MIDAS satellite orbit.⁸⁰ The success came too late to revive the operational aspect of the program, but as Air Force General Bernard Schriever noted in 1960, “...in a technological war of the kind we are now waging the laboratory, the assembly line, and the test range comprise the combat theater. Research and development has become almost an operational function, inseparable from the strategic performance of the systems which it produces.”⁸¹

On the ground in Alaska, the MIDAS station also produced its share of controversy, though on a much smaller scale. When contractors assigned to the project first arrived in the Delta Junction area, they were housed and fed in various local lodging establishments, providing a major boost to the small town’s economy, already highly dependent on the military.⁸² Then, shortly after this highly desirable (in the view of local business owners) arrangement began, it was terminated, and civilian contractors were required to move to newly built housing on Fort

⁷⁹ Price, *Tracking the Unthinkable*, 14.

⁸⁰ Adam Yarmolinsky, Memorandum for Mr. Timothy J. Rearden, Special Assistant to the President, May 31, 1963 w/ att: “A MIDAS Satellite Was Successfully Launched by Air Force on 9 May 1963 from Vandenberg AFB.”

⁸¹ Lt. Gen. Bernard A. Schriever, “The Operational Urgency of R & D,” *Air University Quarterly Review* 12 (Winter/Spring 1960-61), 234, quoted in Price, *Tracking the Unthinkable*, 15-16.

⁸² W. A. (“Bill”) Seitz to Sen. Ernest Gruening, September 7, 1961, Delta Junction, Alaska, series 5 C1, box 186, folder 231, Ernest Gruening Papers, University of Alaska, Fairbanks, Archives (hereafter referred to as EGP).

Greely, prompting a flurry of letters to the desk of Senator Ernest Gruening in Washington.⁸³ Sen. Gruening dutifully made inquiries on behalf of his constituents, and after the Army Legislative Liaison Office directed him to the Air Force, since the MIDAS project was under their authority, finally received word the following summer that under the contract with Philco Corporation for operation of the MIDAS site, housing the employees on base in the barracks built for that purpose was significantly cheaper than housing in the community.⁸⁴

These coveted guests were the force that actually ran the site, which required an estimated staff of 99 technicians for the various technical tasks, including automatic tracking radar technicians, communications technicians, data processing technicians, instrumentation technicians, and precision measuring equipment technicians.⁸⁵ In addition to the technical positions, the site also required operations and maintenance staff to keep the delicate advanced equipment running throughout the frigid Alaskan winters, as well as maintain the air conditioning systems that were necessary to keep the computers on the site cool during the summer.⁸⁶

The role this staff played in MIDAS was essential for both the initial operational aspirations of the program and the critical technological advancements that were the ultimate outcome. The purpose of a satellite ground station was to keep track of the satellite as it orbited the earth and to receive signals from the satellite containing the information the satellite was launched to collect.⁸⁷ To perform that task, the Donnelly Flats station was equipped with a

⁸³ Ibid.

⁸⁴ Col. R.E. Vollendorff to Sen. Ernest Gruening, June 22, 1962, Washington, D.C., EGP; and Col. Carl V. Schott to Sen. Ernest Gruening, August 2, 1962, Washington, D. C. EGP.

⁸⁵ Price, *Tracking the Unthinkable*, 53.

⁸⁶ Ibid., 51.

⁸⁷ Ibid., 18-19.

receiver building containing a sixty-foot antenna dish covered by a 110-foot diameter rigid radome.⁸⁸

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Figure 4- Receiver Building 2⁸⁹

There were three such buildings constructed at the site, but the antenna was only installed in Receiver Building Two, due to the alteration in the outlook of the program between the site's initial construction and design and its completion.⁹⁰ The site also included a power plant to provide the specialized power needs of the tracking and data processing equipment, a vehicle warm storage building, and the center of the operation, the Administration and Data Acquisition Building.⁹¹

⁸⁸ Ibid., 40.

⁸⁹ Ibid.

⁹⁰ Ibid.

⁹¹ Ibid., 38.

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Figure 5- Site Plan⁹²

The first phase of operations at the site, from 1961-1963, consisted mostly of preparation and work on the satellite support equipment, since very few of the launches during this time were successful. Despite the lack of active satellite support, however, the technicians at Donnelly Flats still engaged in crucial activities, as most of the equipment they were dealing with was brand new technology that was still full of glitches. One of the technicians who worked on the timing equipment at the site during this period reported that he “spent every day trying to get it operational.”⁹³ These efforts were no doubt crucial “to later improvements in MIDAS and its successor systems.”⁹⁴

⁹² Ibid., 35.

⁹³ Quoted in Price, *Tracking the Unthinkable*, 53.

⁹⁴ Price, *Tracking the Unthinkable*, 53.

After the launch of MIDAS 9 on July 18, 1963, the MIDAS program became primarily focused on R & D, and no more launches under that name were attempted. Consequently, the Donnelly Flats station went into caretaker status by some time in 1964.⁹⁵ The results of the MIDAS 7 and MIDAS 9 satellites, however, had provided sufficient support for the idea of a satellite missile warning system that a successor program, known as Program 461, went ahead in 1965 and 1966, with its first launch in June 1966.⁹⁶ The Donnelly Flats station was reactivated to support these new launches, and it experienced its most active period of operation in actual support of satellites, beginning on April 6, 1966.⁹⁷ It remained active in support of these satellites until November 1967, when it was closed permanently, due to the impending introduction of Defense Support Program (DSP) satellites.⁹⁸ The DSP program employed three satellites in a geostationary orbit about 22,300 miles above the equator, making use of the advancements in satellite communications technology that had come about in part due to the MIDAS program.⁹⁹

In addition to the systems the U.S. government sought to put in place to protect its citizens from a possible nuclear attack, the threats posed by other types of weapons were never forgotten. Inspiring fears second only to nuclear weapons were the assumed chemical and biological weapons (CBW) capabilities of the Soviet Union. In the aftermath of World War II, the Allied nations discovered massive German stockpiles of nerve agents that had never been used, but were the subject of great interest, especially to the Soviets, who dismantled chemical

⁹⁵ Ibid., 52.

⁹⁶ Richelson, *America's Space Sentinels*, 41-44.

⁹⁷ Robert E. McClellan, Space and Missile Systems Office, *History of the Space Systems Division, July-December 1965*, October 1968, 37, <http://www2.gwu.edu/~nsarchiv/NSAEBB/NSAEBB235/09.pdf>, accessed May 20, 2014; and Price, *Tracking the Unthinkable*, 53.

⁹⁸ Price, *Tracking the Unthinkable*, 53.

⁹⁹ Jeffrey T. Richelson, "Space-Based Early Warning: From MIDAS to DSP to SBIRS," Electronic Briefing Book, *The National Security Archive*, <http://www2.gwu.edu/~nsarchiv/NSAEBB/NSAEBB235/20130108.html>, accessed May 20, 2014.

manufacturing facilities and transferred them to the Soviet Union.¹⁰⁰ Though U.S. intelligence did not have a clear picture of the Soviet capabilities, U.S. planners were determined to be ready for an attack. The Stevenson Report in 1950 concluded, “the United States should be prepared to defend itself against biological warfare and to wage biological warfare offensively.”¹⁰¹ To facilitate this, the United States engaged in extensive research on both biological and chemical weapons as the Cold War deepened, leading to the mass-production of sarin and VX nerve gas, as well as hundreds of open-air tests of biological agents for use against both crops and personnel.¹⁰²

CBW tests occurred in numerous places around the United States and its territories, and as with all weapons considered for use in a war against the Soviet Union, the question of how these agents would fare in an arctic environment was of greatest importance to U.S. planners. Throughout the 1950 and 1960s, tests of CBW went on at Fort Greely, with the activity taking place on the Gerstle River Test Site, about 30 miles southeast of the main fort, and in the Delta Creek area west of the Delta River far from inhabited areas.¹⁰³ “Limited cold weather dissemination testing of GB [Sarin] and VX was conducted in this area,” including munitions from 1955-1957 and mines in the winter of 1960-61.¹⁰⁴

¹⁰⁰ Edward M. Spiers, *A History of Chemical and Biological Weapons* (London: Reaktion Books, 2010), 62.

¹⁰¹ “Report of the Secretary of Defense’s Ad Hoc Committee on Chemical, Biological, and Radiological Warfare,” June 30, 1950, quoted in John Ellis Van Courtland Moon, “The US Biological Weapons Program,” in *Deadly Cultures: Biological Weapons since 1945*, Mark Wheelis, Lajos Rózsa, and Malcom Dando, eds. (Cambridge, Mass.: Harvard University Press, 2006), 30.

¹⁰² Spiers, *History of Chemical and Biological Weapons*, 60-61.

¹⁰³ Office of the Project Manager, Department of the Army, “Installation Assessment of Gerstle River Test Site,” Records Evaluation Report No. 105, Volume 1 (Aberdeen Proving Ground, MD: Chemical Demilitarization and Installation Restoration, December 1976), II-1, <http://arcticcircle.uconn.edu/SEEJ/NMD/alaska/greely/gerstle1.htm>, accessed May 22, 2014.

¹⁰⁴ *Ibid.*

As part of a massive review of the nation's armed forces conducted after President Kennedy took office in 1961, a chemical and biological warfare review known as Project 112 took place. "As part of the Project 112 review, the Joint Chiefs of Staff convened a working committee that recommended a research, testing, and development program for chemical and biological weapons. To oversee this program, the Deseret Test Center was established at Fort Douglas, Utah, in 1962."¹⁰⁵ Under the authority of the Deseret Test Center (DTC), various tests of sarin and VX gases, as well as biological agents such as tularemia, were conducted at Gerstle River. DTC Test 63-3, known as "Whistle Down" tested "the existence, nature, and extent of the hazard from Sarin and VX nerve agents on environmental clothing, snow, and frozen ground" by exposing manikins to the downwind effects of Sarin-filled munitions and a VX-filled M23 landmine.¹⁰⁶

Similar tests on VX and Sarin took place between 1963 and 1966, investigating the properties and behavior of these nerve agents in snow and cold temperatures, given code names such as "Elk Hunt," "Devil Hole," "Dew Point," "Swamp Oak," and "Sun Down."¹⁰⁷ Officials were also concerned with biological agents, and from November 30, 1963 to January 8, 1964, DTC personnel carried out tests on the airborne spread of biological agent in arctic conditions, using relatively harmless bacteria to simulate a more dangerous release.¹⁰⁸ The test known as "Red Cloud," carried out between November 1966 and February 1967 investigated the biological

¹⁰⁵ Office of the Assistant Secretary of Defense (Health Affairs), Deployment Health Support Directorate, "Fact Sheet: Deseret Test Center, Elk Hunt, Phase I," October 9, 2002.

¹⁰⁶ Office of the Assistant Secretary of Defense (Health Affairs), Deployment Health Support Directorate, "Fact Sheet: Deseret Test Center, Whistle Down," October 9, 2002.

¹⁰⁷ "Installation Assessment," II-3 –II-4.

¹⁰⁸ Office of the Assistant Secretary of Defense (Health Affairs), Deployment Health Support Directorate, "Fact Sheet: Deseret Test Center, Night Train," October 9, 2002.

decay rate and animal infectivity of the bacteria responsible for tularemia, also known as rabbit fever, at extremely low temperatures.¹⁰⁹

For the most part, these tests were carried out with the utmost of caution, and considering the extreme remoteness of the actual test sites, the minimum of danger to civilian populations. One incident from the winter of 1965-66 caused significant alarm in the community when word got out several years later, however. As later inquiries into the matter by Alaska's senators would uncover, during an effort to clean up and dispose of excess toxic munitions that had been part of an investigation into storage stability in an arctic environment in late 1964, a quantity of those munitions were placed on the ice of a small lake in the Gerstle River Test Site, and then, due to a delay in the process, forgotten.¹¹⁰ When the ice on the lake melted in the spring, the munitions sank to the bottom and remained there until 1968, when efforts to retrieve them began.¹¹¹ ATC and DTC forces worked during the summer of 1969 to drain the lake and recover all the potentially toxic materials.¹¹² Despite local concerns, no apparent contamination of the area occurred, and the intensive clean-up efforts seemed to ensure the ecological security of the land.¹¹³

President Nixon's November 1969 pledge to end U.S. testing and development of all biological and most chemical weapons, however, ended the Alaskan testing. Nixon swore that the United States would never engage in biological warfare, even in response to an attack in kind, and limited chemical weaponry to things such as riot control agents and the chemical

¹⁰⁹ Office of the Assistant Secretary of Defense (Health Affairs), Deployment Health Support Directorate, "Fact Sheet: Deseret Test Center, Red Cloud," October 9, 2002.

¹¹⁰ Col. Philo A. Hutcheson to Senator Mike Gravel, December 21, 1970, Washington, D.C., in Richard A. Fineberg, *The Dragon Goes North: Chemical and Biological Warfare Testing in Alaska* (Santa Barbara, CA: McNalley & Loftin, 1971), 153.

¹¹¹ Ibid.

¹¹² "Installation Assessment," II-11.

¹¹³ Ibid.

defoliants in use in Vietnam.¹¹⁴ The clean-up effort, spurred in part by intense scrutiny from local residents and Alaskan politicians, continued into the early 1970s, but Fort Greely's subjection to such agents had come to an end, without evident harm to the environment or civilians.¹¹⁵

In many ways, the Cold War was a struggle of scientists, and Fort Greely was the site of several projects that were thought to be of immense value to the nation in its fight against communism.¹¹⁶ Though the harnessing of the atom for non-combat military purposes would not fundamentally alter the Army, the nuclear power plant at Fort Greely "contribute[d] to the advancement of nuclear power to generate electricity for peaceful purposes," and proved that it could be a viable option even in a cold, remote area, as well as allowing for the development of an important technique for extending the useful life of nuclear reactors.¹¹⁷ Fortunately, there was never a need to protect the nation against the other application of the power of the atom, but the MIDAS program and its outpost on Fort Greely greatly advanced the nation's ballistic missile tracking and warning capabilities, and provided a foundation for programs that would give reassurance to millions of Americans who lived in fear of a nuclear attack. Likewise, deadly chemical and biological agents were never employed against U.S. troops or civilians, but the tests conducted at Gerstle River supplied crucial knowledge about how those agents behaved in the open air, as well as how the environment could be cleansed of their presence. Scientific advancements that took place at Fort Greely were an innate product of the Cold War, and help to

¹¹⁴ James M. Naughton, "Nixon Renounces Germ Weapons, Orders Destruction of Stocks; Restricts Use of Chemical Arms," *New York Times*, November 26, 1969, 1; and Richard Nixon, "Statement on Chemical and Biological Defense Policies and Programs," November 25, 1969, *The American Presidency Project*. <http://www.presidency.ucsb.edu/ws/?pid=2343>.

¹¹⁵ "Installation Assessment," II-28-29.

¹¹⁶ Zuoyue Wang, *In Sputnik's Shadow: The President's Science Advisory Committee and Cold War America* (New Brunswick, NJ: Rutgers University Press, 2008), 1-5.

¹¹⁷ Suid, *The Army's Nuclear Power Program*, 123.

solidify its place in the history of that struggle and provide further examples of the inescapable Cold War context in which it existed.

Conclusion

Given the inextricable links between Fort Greely and the era of the Cold War, it was inevitable that the collapse of the Soviet Union and the end of the ideological struggle between superpowers would significantly affect the mission and future of the installation. The end of the Cold War closely coincided with a drastic round of military base closures under a procedure known as Base Realignment and Closure (BRAC). In the first round of cuts in 1991, a federal commission recommended the closure of twenty-four Army, Navy, and Air Force bases in fifteen states.¹ Fort Greely's turn came in 1995, when the BRAC Commission report to the President recommended a major realignment. Headquarters for the CRTC and the NWTC were to be transferred to Fort Wainwright in Fairbanks, and the garrison greatly reduced to a minimal staff to support only essential missions. The NWTC had already been halved in size, and the base would continue to operate only as an auxiliary of Fort Wainwright.² Though the functions for which the base had been established would continue to some degree, Fort Greely itself would essentially cease to exist.

This state of affairs continued until 2001, but newly elected president George W. Bush made an important decision that would bring Fort Greely back into the forefront of national defense. The perception of a continued threat from ICBMs launched from a rogue state such as North Korea persuaded President Bill Clinton in 1996 to propose a Ballistic Missile Defense system that would be designed to intercept and shoot down any incoming missiles that threatened

¹ Gwen Ifill, "Final Cut Is Made on Military Bases That Should Close," *New York Times*, July 1, 1991, A1.

² The Defense Base Closure and Realignment Commission, *Defense Base Closure and Realignment Commission 1995 Report to the President* (Alexandria, VA: Defense Base Closure and Realignment Commission, July 1995), 1-3.

the nation.³ One site put forward to host these defensive missiles was the recently realigned Fort Greely. Setbacks in testing of the technology delayed the program, and eventually Clinton was persuaded to put off the final decision on the program until after the 2000 election, placing the decision in the hands of his successor.⁴

The program was highly sensitive diplomatically, since it would violate provisions of the Anti-Ballistic Missile Treaty signed in 1972. Despite the international issues the program raised, Bush was determined to go forward, and in August 2001 work began at Fort Greely in preparation for the installation of missile silos to house the nation's interceptors.⁵ With the work on the missile system came a partial resurrection of sorts for the fort. Though greatly reduced in size from its Cold War levels, Fort Greely regained its independence from Fort Wainwright, though the vast majority of Greely's former acreage remained with Wainwright.⁶ In 2005, Headquarters for the CRTC returned to Fort Greely.⁷

Though the current Fort Greely does not boast the same area or breadth of mission that it enjoyed during the height of the Cold War, the current level of uncertainty concerning the missile capabilities of rogue states has ensured that it once again has a pivotal role in the defense of the United States. From its earliest beginnings as an airstrip carved from the wilderness in the midst of war, the land along the Richardson Highway just south of the junction of the Delta and Tanana Rivers has been occupied by a force that had an important part to play in the nation's security and ability to fight wars.

³ Richard Dean Burns, *The Missile Defense Systems of George W. Bush: A Critical Assessment* (Santa Barbara, CA: Praeger Security International, 2010), 64.

⁴ Ibid.

⁵ James Dao, "Work to Begin on Site for Testing Missile Defense," *New York Times*, July 12, 2001, A20.

⁶ "History of Fort Greely," <http://www.greely.army.mil/about/history.aspx>, accessed May 22, 2014.

⁷ "US Army Cold Regions Test Center: History."

Given Russia's historical relationship with Alaska, it is fitting that from its earliest incarnation Fort Greely was intimately intertwined with U.S./Russian relations. The location's role in U. S. wartime collaboration with the Soviet Union ultimately aided in defeating the Nazis, but within two years of the end of that conflict, the area would host troops undergoing training designed to ensure their ability to defeat their former allies in an anticipated war. As the Cold War steadily grew colder, the icy plains of Delta Junction saw a permanent military installation sprout up from the hasty accommodations of wartime; an installation whose very existence was dedicated to preparing all possible U.S. forces to resist an attacker who specialized in winter fighting.

The Soviet Union's threat to the West lent urgency to every lesson in skiing or making shelter in the snow covered north, or traversing a glacier. Every rigorous test of a weapon or vehicle's cold weather performance had at its core the understanding that a malfunction due to the cold could one day cost a soldier his life. As each winter saw massive groups of soldiers arrive in Alaska to practice the defense of America's northernmost outposts, the thought of when those exercises might become reality motivated thousands of men to give urgency to the faux battle at hand.

Without the looming menace of the Soviet Union, a state of the art nuclear power plant would likely never have found its way to one of the Army's remotest bases, nor would massive computers have resided under the shadow of Donnelly Dome, receiving signals from satellites that passed thousands of miles overhead. What purpose would there have been for men in protective gear to fire shells loaded with deadly chemicals across the Alaskan wilderness? Without the Cold War, scientific inquiries might never have found their way to Fort Greely, and without Fort Greely, the progress of technology to fight the Cold War would have been less sure.

Contrary to the Army's conclusion that Fort Greely had only negligible historical significance, and therefore did not merit preservation under the National Historic Register Act, this thesis offers a significantly different assessment. The Arctic Test Branch, the Arctic Test Board, the Arctic Test Center, the Cold Regions Test Center. The Army Arctic School, the Army Arctic Indoctrination School, the Cold Weather and Mountain School, the Northern Warfare Training Center. These organizations, under all their names prepared the U.S. Army to fight battles that thankfully never occurred. The lack of implementation of the lessons taught at Fort Greely does not lessen their important contribution to the history of Cold War America. As unassuming as Fort Greely's appearance is, its historical importance is today mirrored by its contemporary relevance to national defense. A military installation birthed with and shaped by the ideological struggle with Communism, Fort Greely's past cannot be understood apart from its Cold War context.

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