

FACT SHEET

APVR-RPW-EV/Natural Resources Branch
William Gossweiler/384-3017
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1. SUBJECT: Eagle River Flats

2. PURPOSE: Identify and remediate the cause of thousands of water deaths occurring on Eagle River Flats (ERF), Fort Richardson, Alaska.

3. FACTS BEARING ON THE SUBJECT:

a. The ERF is a 2,165 acre estuarine salt marsh which has been used as the primary ordnance impact area for Fort Richardson since the mid-1940s. It is an important staging ground for waterfowl, including ducks, geese and swans, during the spring and fall migrations.

b. In 1981, it was first discovered that unusually high numbers of waterfowl and shorebirds were dying on the ERF, the cause of which was not evident. Random ground searches between 1982 and 1987 defined the magnitude of the problem but failed to make any strides in identifying the cause. Reacting to the severity of the situation, in 1987, an inter-agency Task Force, with representatives from the U.S. Army, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and Alaska Department of Fish and Game, and Department of Environmental Conservation was formed to investigate the waterfowl mortality phenomena in a more clinical and structured way.

c. In 1988, Army and U.S. Fish and Wildlife service biologists conducted over 30 systematic ground searches in a study area comprising approximately 8% of the ERF between April and November. The remains of over 900 waterfowl were found in the study area, 350 of which were whole carcasses and the remainder individual feather piles left by Eagles, Ravens and Gulls. Analysis of bird tissue, water and sediment were inconclusive.

d. The Army and other agencies were now convinced, more than ever, that a toxic material associated with military munitions was probably responsible. There was a heightened concern among the investigators, governmental agencies and general public, not only for the great wildlife losses but for the potential and yet unknown risk to people, especially local duck hunters.

e. Determined to resolve the ERF problem as expeditiously as possible, the U.S. Army Garrison, AK requested assistance from the U.S. Army Toxic and Hazardous Materials Agency (now the Army Environmental Center), who in turn hired a private contractor to conduct a site investigation. The results of this 1989 investigation indicated that chemicals from explosive ordnance were the probable cause of the mortality. As a result of that statement, the Commanding General suspended all firing in the flats pending further investigation. Subsequent field and laboratory studies conducted by Cold Region Research Engineering Laboratory

-2-

(CRREL) between 1990 and 1992 determined that ingestion of White Phosphorous (WP) particles used in smoke obscurants was the likely cause of the mortality. Up until this discovery, no techniques existed for analyzing WP in living tissue or sediment.

f. Textbook descriptions of WP portray it as an extremely reactive substance which is quickly oxidized and burned in the presence of oxygen. It was primarily for this reason and the lack of analytical technology that WP was ignored as a prime suspect during earlier investigations. CRREL studies clearly showed that under certain conditions the chemical fate of WP does not exactly adhere to what had been described in previous literature. Based on what they were finding in the sediment samples CRREL theorized that following a WP explosion, burning particles of WP that happened to fall into wet or water covered areas were extinguished and the oxidation process slowed dramatically as they lay buried in the bottom sediments. These highly poisonous particles are picked up either intentionally or inadvertently by waterfowl sifting through the pond sediments in search of seeds and small invertebrates which these particles may be mistaken for. In the birds gizzard and stomach the particles along with other ingested materials are crushed and exposed to the digestive enzymes and move into the birds tissues.

g. An Environmental Assessment was done which determined that the Army under a number of restrictions, could continue to use ERF as a firing range for non WP containing munitions in the winter when ice was thick enough to shield underlying sediments. These activities resumed in 1992.

h. The human health risk issue from consumption of hunter harvested ducks in Cook Inlet was found to be insignificant. None of 305 gizzards collected from ducks shot by hunters in major hunting areas near ERF, contained detectable levels of WP. Furthermore, based on statistical analysis of existing data it was determined by both the Army Environmental Hygiene Agency and the Alaska Department of the Public Health that for the substance to pose a health concern waterfowl tainted with it would have to be consumed at a physically impossible rate.

i. In 1994, Fort Richardson was listed on the Environmental Protection Agency's National Priorities List.

4. ACTION TAKEN:

a. From 1992 to 1994, studies were conducted to further characterize the site, better define the fate and transport mechanism, and screen remedial alternatives. Pilot field treatability studies began in 1993 and were expanded in 1994-1995 to include dredging, capping, chemical repellents, natural attenuation, and pond drainage.

b. In accordance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), The National Contingency Plan (NCP) and Federal Facilities Agreement (FFA), a Remedial Investigation (RI) Feasibility Study (FS) Management Plan has been prepared. The purpose of this management plan is to document the approach and methodologies used to conduct the RI for ERF. The RI will be used later to develop remedial alternatives in the FS for ERF. The FS will then be used to develop a Proposed Plan (PP) and Record of Decision (ROD) to achieve site remediation of ERF. As it currently stands, the ROD is to be completed by 17 March 1998 after which clean-up operation officially commences.

c. Past Expenditures - Total expenditure from 1982 to date is \$12,130,000. Funding of this investigation has enabled the Army to not only identify the toxic agent, but to extensively characterize the entire contaminated site and test a number of remedial alternatives. In doing so, the Army has "taken the Bull by the Horns" so to speak by providing the majority of much needed information for the upcoming Remedial Investigation, ascertaining a negative human health risk and attempting to accelerate the remediation of the site.

d. Both the Environmental Protection Agency (EPA) and the Alaska Department of Environmental Conservation (ADEC) have been working closely with the Army in tackling this difficult problem. Their flexibility, willingness to accept less than perfect solutions and general support of our efforts has resulted in a productive partnership.

5. ACTION REQUIRED:

a. In accordance with CERCLA, NCP, and FFA requirements complete the RI/FS, PP and ROD.

b. Continue dredging activities (approx 275k per year).

c. Drain several of the contaminated ponds using explosives to create drainage ditches (approx 75k per year).

d. Develop "Assessment End Points" using baseline data. End Points will be used to determine the success of the clean-up. End Points will be either biological, such as a species of waterfowl that is dying on the ERF or chemical, such as the quantity of WP remaining in a given area of sediment, or both.

e. Continue to keep the public well informed of ERF efforts and activities.

- f. Continue to monitor bird use and mortality including Aerial Surveys, Transacts and Telemetry (200k per year).
- g. Continue to haze waterfowl from contaminated areas (100k per year).
- h. Devise and implement economical method for application of Aqua Blok capping material (100k per year).
- i. Future Funding - The Cost-to-Complete the ERF action including the Remedial Design (RD), the Remedial Action (RA), and all operation and maintenance for the next 20 years is estimated at \$ 28,279,000. In addition, Cost-to-Complete the adjacent Explosive Ordnance Disposal (EOD) pad action within the same time frame is \$7,164,000. The EOD pad is tied to the ERF under Operative Unit C (OUC). Grand total for OUC completion is \$35,443,000. It is the intentions of the Army, EPA and ADEC to reduce this figure whenever and wherever possible.

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