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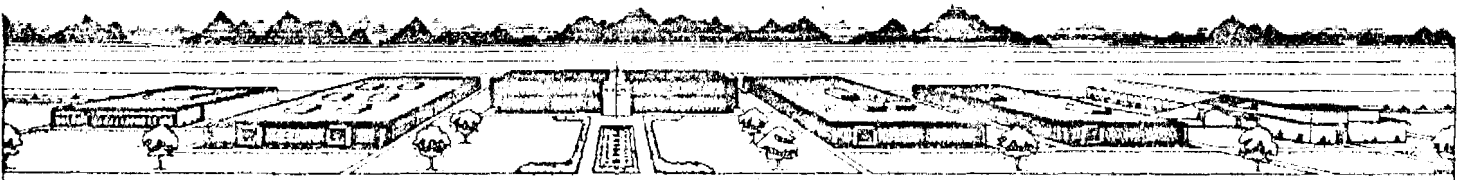
FINAL REPORT OF OFF-SITE SURVEILLANCE
FOR THE
FAULTLESS EVENT, January 19, 1968

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by the
Southwestern Radiological Health Laboratory
Department of Health, Education, and Welfare
Public Health Service
Consumer Protection and Environmental Health Service

April 1969

This surveillance performed under a Memorandum of
Understanding (No. SF 54 373)
for the
U. S. ATOMIC ENERGY COMMISSION



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INTRODUCTION

The Faultless Event of Operation Crosstie was an underground nuclear test conducted at 1015 hours PST on January 19, 1968, by the Lawrence Radiation Laboratory at the Central Nevada Supplemental Test Area (CN-STA).

In accordance with the AEC-PHS Memorandum of Understanding, an environmental surveillance and community information program was conducted in the off-site area by the PHS Southwestern Radiological Health Laboratory(SWRHL) during the test period.

This report describes the procedures and results of that operation.

PRE-EVENT ACTIVITIES

Milk and Water Sampling

Eight months prior to the Faultless Event and in support of CN-STA operations, the SWRHL began an extensive survey of the human and milk cow population distribution in and around Central Nevada.

During June, July and August, 1967, the Nevada counties of Elko, Eureka, Lander, Lincoln, Nye and White Pine, and the Utah counties of Box Elder and Tooele were surveyed. This information was then collated and published in a directory listing all human and milk cow population locations and citing their azimuth and distance from the CN-STA.

In addition to the 36 routine milk sampling stations maintained on a continuous basis around the Nevada Test Site(NTS) special milk sampling stations were established at Battle Mountain, Beowawe,

Currie, Elko, Montello and Wells, Nevada, five months prior to the Faultless Event(Figure 1). Water sampling stations were also added to the routine NTS off-site network at Battle Mountain, Carlin, Currie, Elko, Oasis, Ruby Valley and Wells, Nevada, and Wendover, Utah(Figure 2). Milk and water samples were collected monthly at the additional stations. The routine NTS off-site stations provided monthly sample information covering years preceding the event.

Air Sampling and Dosimetry

Six months prior to the Faultless Event, SWRHL expanded its routine NTS off-site air surveillance and dosimetry programs to include the outlying areas north and northeast of CN-STA. Permanent air sampling stations were established at Blue Eagle Ranch, Currie, and Duckwater, Nevada, increasing surveillance capabilities to 109 routine stations operating in the off-site areas(Figure 3). Twenty-two air samplers in Central Nevada, including the off-site areas adjacent to NTS, were operating with charcoal cartridges in addition to the particulate filters routinely used in the SWRHL air sampling stations.

Supplemental to the normal dosimetry network for NTS, dosimetry stations with five film badges and three thermoluminescent dosimeters per station were added at Battle Mountain, Carlin, Currie, Dunphy, Elko, Halleck, Oasis, Ruby Valley and Wells, Nevada, and Wendover, Utah(Figure 4). These thermoluminescent dosimeters were changed on the same monthly schedule as the routine NTS off-site dosimetry network. Four days prior to the event, 15 special TLD stations with two dosimeters each were established at five-mile intervals from 25 miles north of Currant

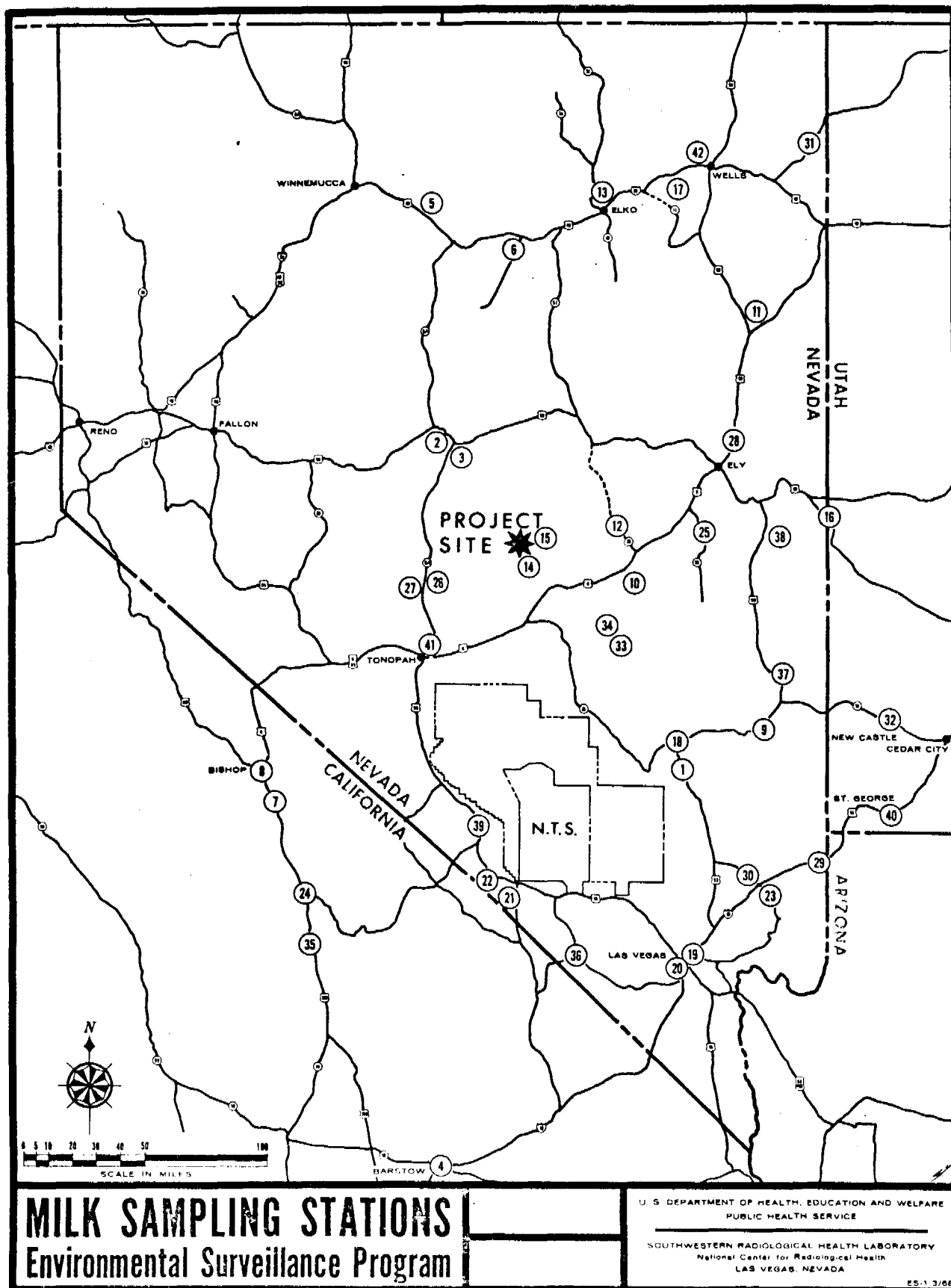


Figure 1. Location of Milk Sampling Stations.

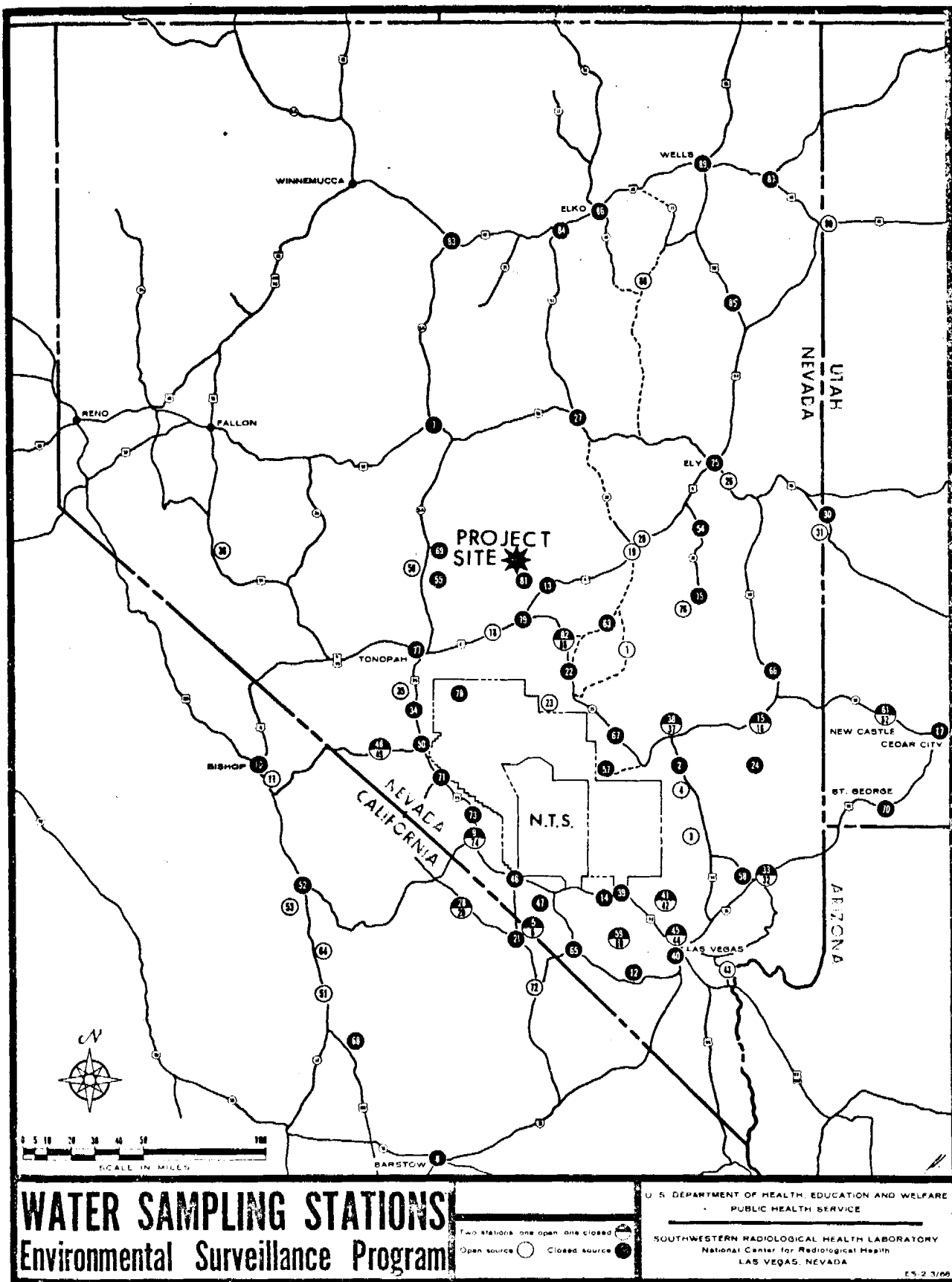
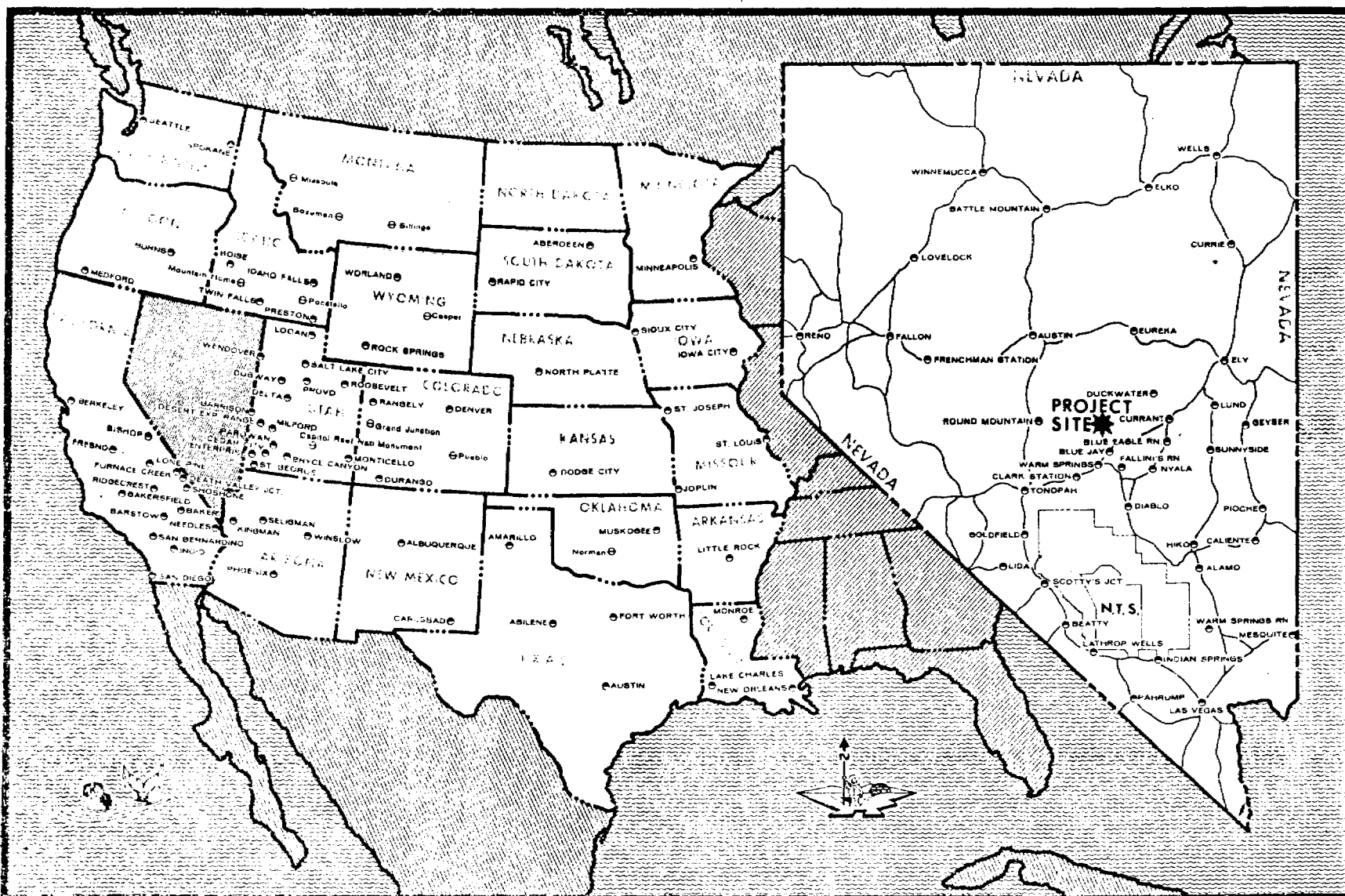


Figure 2. Location of Water Sampling Stations.



AIR SURVEILLANCE NETWORK STATIONS **Environmental Surveillance Program**

Figure 3.

REGULAR SURVEILLANCE STATIONS STANDBY SURVEILLANCE STATIONS

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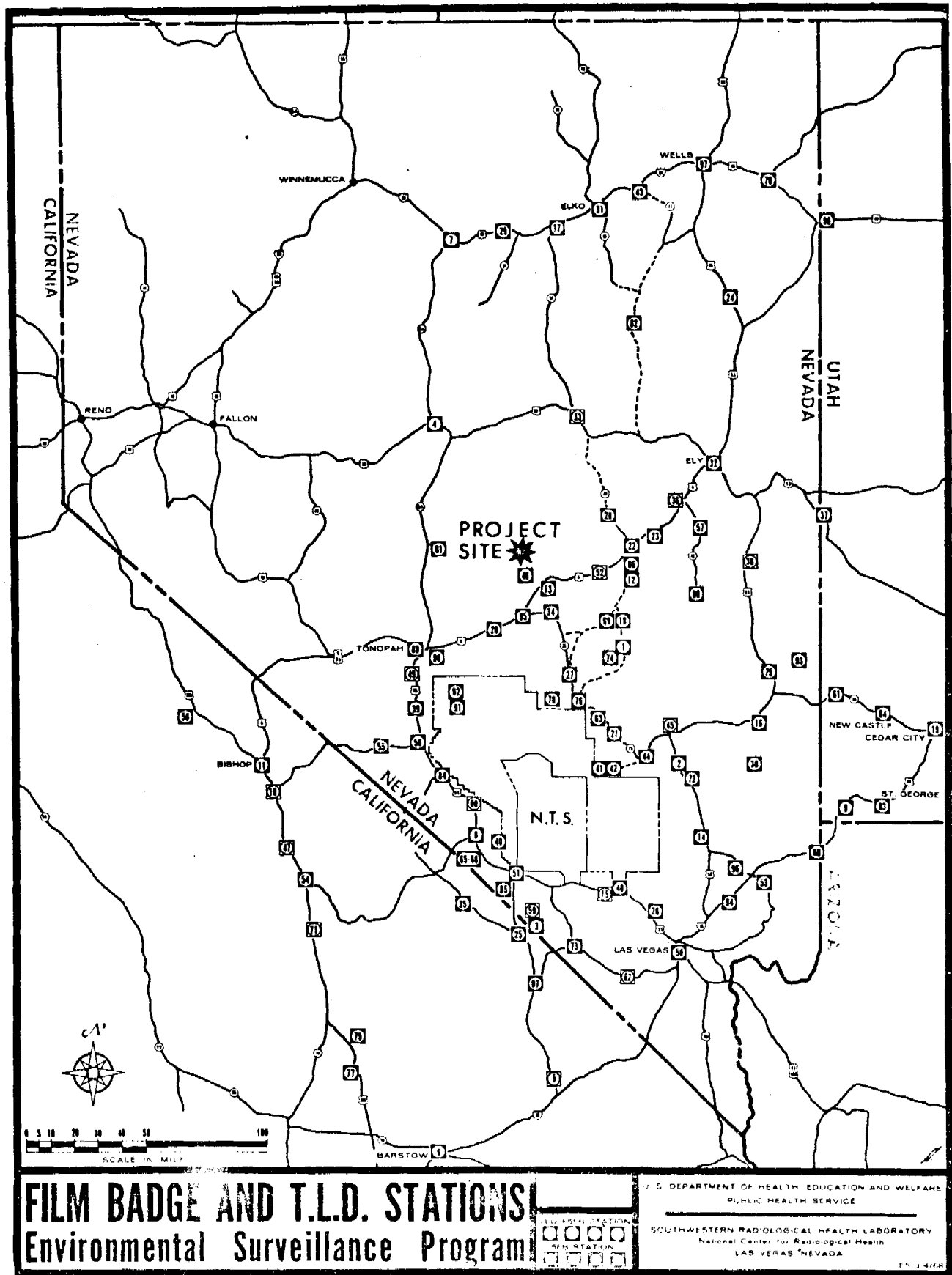


Figure 4. Location of Dosimetry Stations.

to 40 miles south of Carrant, providing more comprehensive surveillance of the populated areas which include Blue Eagle Ranch, Carrant, Duckwater and Nyala, Nevada. Additionally, a network of 27 Eberline RM-11 gamma exposure rate recorders was operating in the off-site areas during Faultless activities.

Ground Motion

Owners and occupants of all man-made structures within a 55-mile radius of the Faultless Event site and of certain buildings in the towns of Austin, Ely, Eureka, McGill and Tonopah were contacted to obtain permission for structural inspections. This structural analysis, performed by an engineering firm, provided reference data for postshot studies of ground motion and for investigations of damage, if any occurred. SWRHL conducted a survey during the five months prior to January 1968, of all mining operations within approximately 100 miles of CN-STA to determine their location and schedule of operation during the event.

One day before Faultless, persons in Belmont and Eureka were cautioned to remain clear of free-standing walls; owners were advised to empty elevated water storage tanks located at Barley Creek Ranch and Blue Eagle Ranch; and residents of the Stone House Ranch in Monitor Valley and the R. O. Incorporated Ranch near Round Mountain were alerted to hazards of possible rock falls from stone buildings.

Community Information Centers

Five days prior to the Faultless Event, SWRHL personnel established community information centers in Austin, Ely, Eureka, Round Mountain and Tonopah, Nevada. These centers, equipped with telephones and remaining open during normal working hours, conducted

concentrated public information programs to keep the respective areas informed of Faultless activities. The Faultless activity schedule was posted at major business establishments and all appropriate AEC announcements were coordinated through local news media. Information Center personnel, responsible for maintaining liaison with local officials and other representatives, provided information and advice on effects from test operations. Persons were advised that high structures might amplify ground motion and were cautioned that no one should occupy precarious positions during detonation when ground motion might startle him or otherwise endanger his safety. Requests from residents were honored whenever possible. In compliance with requests at Eureka, SWRHL representatives presented two showings of films on AEC nuclear testing, one for local school children and another for the general public. SWRHL personnel were also available for public information and other coordinate services in Alamo, Beatty, Caliente, Goldfield and Pioche during the week previous to the Faultless Event.

General Adjustment Bureau(GAB) personnel were located in the communities named above and were introduced to local authorities through the Community Information Centers. Inquiries subject to GAB review and consideration were also forwarded from the Information Centers.

Medical and Veterinary Services

A PHS veterinary officer and a PHS medical officer were available at the site to investigate any reported incident or complaint

relating to Faultless operations. One week prior to the Faultless Event, the medical officer established liaison with medical personnel at CN-STA, Ely, Erueka, and Tonopah, advising them of his association with Faultless and volunteering his assistance should he be needed. Prior to detonation, the veterinary officer, accompanied by a SWRHL monitor, manned a station inside the controlled area 18 miles east of surface ground zero where two shepherds were tending their flock.

Three beef cattle and two deer from Hot Creek Valley were sacrificed during the week prior to the Faultless Event, and necropsies were performed for histopathological analysis and radioassay. Results from these analyses were recorded for reference, and similar postshot sampling was anticipated had any radioactivity been released by the Faultless Event.

EVENT DAY ACTIVITIES

Aerial and Ground Monitoring

Aerial radiological surveillance for the Faultless Event was supplied by three PHS monitors in a PHS aircraft equipped for tracking and sampling radioactive airborne debris.

Forty-four SWRHL personnel held field assignments for the Faultless experiment. Twenty-eight ground monitors were stationed in the off-site areas on January 19 to perform environmental monitoring and sampling in the event of a radioactive release. Personnel with two-way radio-equipped vehicles were also standing by at the 10 active mining areas within 50 miles of the project site and at the open pit mines near Ruth, Nevada. These personnel notified the miners of Faultless operations, suggested they remain

above ground at the time of detonation, and remained at the mines after detonation to report any mine damage.

Roadblocks and Evacuations

Six SWRHL safety personnel assumed locations on-site about 22 miles distant along an arc from 250° to 45° from ground zero at 1600 hours on January 19. This boundary was established to allow evacuation of the immediate test area during execution of the experiment. The SWRHL personnel were teamed with firemen employed by McKenzie Construction Company to maintain continuous vigilance of entry roads; they remained on station through the afternoon of January 19. A SWRHL monitor evacuated the residents of Hot Creek Ranch from this exclusion area in accordance with an agreement made previously between the AEC and the ranch owner.

SWRHL personnel evacuated residents and other occupants on January 19, prior to execution of Faultless, from buildings at the Blue Jay Highway Maintenance Station, the Currant Creek Maintenance Station and Warm Springs. A drilling crew working at the Western Oil Lands site in Railroad Valley was cleared from the drill rig one hour before detonation and returned to the rig 15 minutes following detonation.

SWRHL monitors assisted by Nevada State Highway Patrolmen, established roadblocks at 0900 hours on January 19 at Lockes and two miles south of the Blue Jay Maintenance Station to close Highway 6. Concurrently, screening stations were established at Currant and Warm Springs to notify travelers that this span of highway was closed. These station locations are shown in Figure 5. Upon closure, this span of Highway 6 was patrolled by two SWRHL

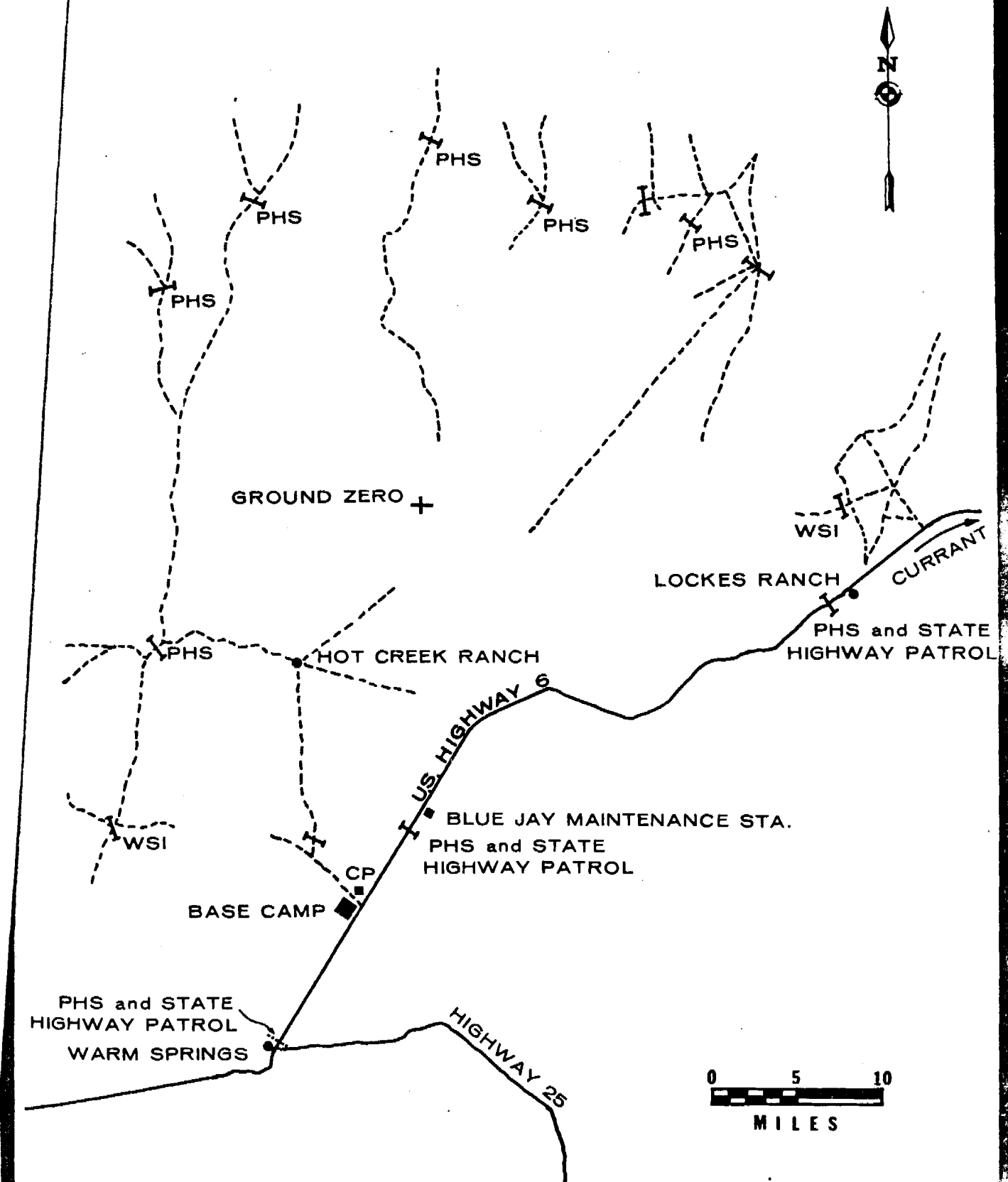


Figure 5. Location of Coordinated Roadblocks and Screening Stations.

monitors beginning from both roadblocks to ensure that no travelers were on the road. Immediately following detonation, the monitors retraveled the road to determine its safety for public travel. The highway was reopened at 1130 hours.

Roadblocks were also set up by Security personnel of Wackenhut Services, Incorporated (WSI).

A PHS monitor assisted by Nevada Highway Department personnel, closed Highway 6 from 0950 to 1030 hours on January 19, through the Horse Range at Currant because of the possibility of falling rocks in the pass.

RESULTS

No radioactivity above normal background levels was detected off-site by ground and aerial monitoring teams, by stationary gamma rate recorders, or in any environmental samples after the detonation or during subsequent sample recovery operations.

Minor rock fall resulting from Faultless ground motion was noted in the Tripp Veteran open pit mine near Ruth. No damages or effects other than ground motion were reported at any of the other mine locations.

CONCLUSIONS

Since no fresh fission products were detected in any environmental sample collected off-site, and no air samples contained levels of gross beta activity above the expected background, it is concluded that no detectable radioactive contamination of the off-site area resulted from this event.

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