Eska Coal Mine
Wishbone Hill
Sutton
Matanuska-Susitna Division
Alaska

HAER No. AK-19

HAER
AK,
13-SUTT,
2-

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
U. S. Department of the Interior
Washington, D. C. 20013-7127

HAER
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HISTORIC AMERICAN ENGINEERING RECORD

Eska Coal Mine

AK-19

Location:	Situated on Wishbone Hill, on the north side of the Matanuska River Valley, 60 miles north of Anchorage, in south-central Alaska. Sutton, Matanuska-Susitna Division, Alaska
Original Use:	Coal mining
Present Use:	None; closed in 1946
Original Owner:	Alaska Engineering Commission
Significance:	Beginning with the first load of coal sledded to the Sutton railroad station in 1917 until the mine was closed for good in 1946, the Eska Coal Mine played an important role in the growth and development of south-central Alaska. The mine was purchased by the Alaska Engineering Commission on June 18, 1917, to supplement the coal produced by private enterprise. Operating as needs dictated, the Eska Coal Mine supplied the Alaska Railroad with coal until the railroad switched to diesel powered engines.[1]
Prepared by:	Bonnie S. Houston Historian Alaska Regional Office National Park Service

This HAER mitigation was made necessary by the conveyance of land belonging to the Federally-owned Alaska Railroad to the State of Alaska.

The Eska Mine was situated on Wishbone Hill, the most dominate feature of the Matanuska coal fields. The coal-laden, canoe-shaped hill is five miles long, with 50' to 300' high cliffs along its ridge. The coal at the Eska Mine was from a tertiary geological formation known as the Chickaloon formation. The bulk of the coal was taken from two groups of bsds, the Eska and the Premier Groups, with the Eska group comprised of Eska, Shaw, and Martin, the most prolific. The Eska group forms a synclins across the eastern end of Wishbone Hill that is bisected by Eska Creek. The low sulphur bituminous coal, while inappropriate for coking, was well suited for producing steam and would become the main source of coal for the steam-powered locomotives of the fledgling Alaska Railroad.[2]

From the beginning, Alaska's railroads and coal mines were linked in a mutual dependency; the coal was needed for the railroad and the railroad was needed to transport the coal to market. Reports of the abundant mineral resources in Alaska had inspired many to venture north in search of fortune, some by mining and others by building railroads. Both enterprises were hampered by federal legislation, heavy taxes and inaccessible lands until the passage of the Alaska Coal Leasing Act of 1914. The Act opened Alaska's coal fields to active exploration, while the railroad act provided for access and export.

The first priority of the Alaska Engineering Commission (AEC), appointed by President Wilson to construct the railroad, was to reach the Matanuska coal fields. Beginning at the mouth of Ship Creek, the port of Anchorage, in the spring of 1916, the tracks were laid as far as King River by the fall. The first load of coal was shipped from the Doherty Mine on Moose Creek at the southern end of Wishbons Hill. A year later, in the fall of 1917, the railroad was completed to the Eska Mine.

Under the provisions of the coal leasing act, William Martin began exploration on Eska Creek in unit seven of the Matanuska coal fields. On January 1, 1917, his interests were taken over by the Eska Coal Mining Company. The first mine shafts were a series of drift tunnels on the west side of the canyon on upper Eska Creek were the Emery, David and Kelly (also called Maitland) coal beds were exposed. When these tunnels were mined out, operations moved to the east side of the creek where work began on the eastern portions of the Eska and Kelly (Maitland) beds. During the winter of 1917, the Eska Mine producsd 35 tons of coal a day. Although the mine was a good producer, the quantity of coal failed to meet the needs of the AEC. Production was hampered by faulted ground that broke the coal seams, the lack of tims to do the exploration, and the lack of capital to purchase equipment.

After examining the mining operations on Wishbone Hill, Bureau of Mines invsstigators Sumner S. Smith and George W. Evans recommended that the government lease or purchase the Eska Mine. The AEC wantsd to determins the extent of the coal beds and the cost of production to see if it would bs feasible for ths AEC to supply the railroad with coal. On Juns 12, 1917, the

AEC purchasad the Eska Mine for $15,650.[3] The AEC made a wise choice when it bought Eska during its first four years of operations, uaing AEC funds and equipment. The mine met the needs of the AEC and saved an estimated $1,702,860 over the cost of importing coal.[4]

The Evan Jones Mine opened in 1920. The AEC then shut down its operation at Eska because it was the intention of the government that the Eska Mine be used only to aupplsment private production and not to interfere with private business. The Eaka Mine remained closed until 1922 when a fire at the Evan Jones Mine halted production. In 1923, Evan Jones came back on line and ths Eska Mine closed again. In 1932, floods on Eska Creek washed out the railroad to the Eska Mine and damaged the mine shafts, making it impossible for the mine to be used in case of an emergency. In the course of needed renovation, the camp was moved aeveral hundred feet down the creek and a new railroad spur was built to connect with the main spur from Sutton. Begun in 1934 and completed in 1935, a new crosscut tunnel intersected the coal beds on both sidss of the creek. The Eska Mine was again ready for operation, if needed. On October 26, 1937, the fire at the Evan Jones Mine, the worst disaster in Alaska mining history, killed 14 miners. The AEC immediately reopened the Eska Mine. When the Evan Jones Mine went back into production in April 1938, the Eska Mine went back on standby until military construction in Anchorage increased ths demand for coal to 250,000 tons per year. The Eska Mine opened briefly for two-and-a-half months in 1940, then in 1941 returned to full-time production of coal for the Alaska Railroad under the direction of the U. S. Army Coal Commission. To meet production needs of 6,000 a month, the Army supplied the necessary capital and equipment, as well as the needed labor force. The high cost of wages and the shortage of labor forced the employment of as many as 50 soldiers a day to meet the production demands. In 1944, when production peaked at 350,000 tons, 60% of the miners working at the Eska Mine were soldiers.[5]

In the mining process, the coal was hauled out of the mine in two-ton end dump mine cars to a 15 ton coal pocket or bin. Then it was transferred by a hopper onto a reciprocating feeder, a conveyor belt with a tooth-like surface. As the coal traveled along the feeder, one mine picked the larger pieces of intrusive material out by hand and tranaferred them to another conveyor that carried them to the dump. The reciprocating feeder transferred the coal to the primary, 24x36-inch singla-roll crusher.[6] The crusher used compression to smash the chunks of coal batween a stationary plate and a roller. The roller had a series of small teeth equally spaced between larger teeth. The coal was caught by the large teeth and held against the plate, while the small teeth did the actual breaking. The size of the coal was determinad by the space between the roller and the plate.[7]

After being crushsd, the coal was sized by a 4x3-foot stationary bar screen with 2-1/2-inch holes. Tha pieces of coal that were larger than 2-1/2 inches were crushsd again by a secondary crusher, while the coal less than 2-1/2 inches was transfarred to the washer for cleaning. The secondary crusher was

a 24x24-inch double roll crusher that crushed by impact rather than compression.[8] The size of the coal was determined by the space between the rollers. The crushed and sized coal was then transferred to the washer.

The Army built a dormitory, mess hall, and power plant at Eska and installed a modern coal washing plant. The washer installed by ths Army at the Eska Mine was a Baum-type jig washer capable of processing 60 tons of coal an hour.[9] Invented in Germany in the late 19th century and introduced in the United States in 1928, the washer was designed to remove impurities such as sandstone and clay from the coal that could not be removed efficiently or effectively by hand, but had to be removed in order for the coal to become an efficient fuel.

The washer, a single unit measuring 4 feet wide by 9 feet, 6 inches long, was divided into three separate cells.[10] the top half of the unit consisted of a screened jig and an enclosed section attached to the recirculating pump, opsrated by an air compressor, forced the water up and down through the coal on the screen. The pulsating motion of the water separated the coal and the intrusive material on the basis of weight into stratified layers. Once separatsd, the intrusive material could be drained off and the washed coal transferred by elevators to a 4x10-foot vibrating screen. Coal larger than one-inch was ready to be used. The "fines" coal, measuring less than 3/8 x 1/2mm (sic), went through the vibrating screen with the water and sludge and required additional processing in order to become usable.[11] It was then transferred to a centrifugal drysr for the extraction of any remaining water.

The dryer used at the Eska Mine was a perforated basket dryer manufactured by McNally Pittsburg that utilized centrifugal force to remove the excess water from the coal.[12] The fine wet coal was loaded in the top of the perforated basket and then spun to remove the water. The dry coal then exited from the bottom of the basket and was ready for use.

To meet the production needs of the Army, the Eska Mine had to be run safely as well as efficiently. One of the crucial factors in mine safety as the Eska Mine was adequate ventilation of the mine shafts, as dust, smoke and gases in the mine shafts were hazardous to the health of the miners and potentially destructive to the mine. The fan/blower unit used to ventilate the mine shafts at the Eska Mine was a Jeffrey centrifugal fan/blower drivsn by a steam-powered Farquhar belt drive. The fan/blower unit was used to force fresh air into the mine shaft and to draw out stale or polluted air. Situated a distance from the mine shaft for safety, the fan/blower unit was enclosed in a log structure that connected it to the main mine shaft. The semi-enclosed squirrel cage fan drew air in from the sides, creating the forward movement of the air. The unit had two sets of doors that controlled the air intake and a flaring chimney with a damper for discharging air. When the back doors of the fan/blower unit were closed to block off the end of the log structures, and with the front doors and the damper open, the stale air was drawn out of the mine shaft, pulled in through the sides of the fan, and exhausted out the

chimney. With the log structure sealed by the front doors, the damper closed, and the back doors of the fan unit open, fresh air was pulled in from the outside and forced into the mine.

The Eska Coal Mine was permanently closed on June 30, 1946. The mine remained intact until 1956, when the washing plant, power plant, and coal bins were sold to Mrak (Mark) Mining Company, a strip mining operation begun in 1952, two miles from the Eska Mine.[13] In 1984, the Department of Natural Resources of the State of Alaska, under the provisions of the Surface Mining Control and Reclamation Act of 1977, set about reclaiming the site. The mining features at the Eska Mine at the time of reclamation were the remains of the main portal, the fan unit house/portal, the water tower, the power plant foundation, the coal storage facilities, the foundation for the coal washing plant, and numerous piles of junk and debris left over from the mining operation. These features were either removed or made inaccessible to alleviate any potential hazard to the public or endangerment to the environment.[14]

The main portal was located 650 feet west of the main body of the camp. The portal had caved in and only a few decaying timbers were visible. A short distance to the west of the main portal were the remains of a 2x2-1/2x3-feet high wood frame power magazine.[15] Situated 110 feet northwest of the main portal was the remains of the foundation of the compressor house. Moss covered the decaying wood flooring that covered portions of the 45x15x3-feet thick and 20x15x2-feet thick concrete slabs.[16]

Seventy feet off the northwest side of the access road to the Eska Mine were the 77x52-foot remains of the reinforced concrete foundation for the power plant. The foundation was divided into three main sections, consisting of the feeder bins, augers, and furnace and boiler pads. There were six storage bins with 12-inch thick, 6-foot high walls that graduated to 8-1/2 feet high on the outside of the structure.[17] Next to the storage bins were the augers that fed the coal to the furnaces and the boilers.

The remains of the foundation for the washing plant, a 30x45x4-feet thick cement pad, were located one hundred feet southwest of the power plant foundation. The cleaned coal was transported to the power plant through a network of tunnels. Ranging in size from 6x6-feet to 10x10 feet, the 70-foot tunnel was lined with 4 feet of concrete and supported by steel I beams and timber supports.[18]

The coal processing facility was located 150 feet northwest of the access road to the Eska Mine. The facility consisted of four separate tiers connected in stair step fashion. The first tier, apparently used as an unloading dock, was a 50x40-foot cement slab supported by 6-foot steel I beams and twenty 2x2x4-feet concrete footings. In the center of the 50x40-foot concrete pad of the second tier were the remains of a partially-collapsed brick oven on a 2x2-foot concrete pad. The second tier was separated from the first and third

tiers by an 8-inch thick, 10-feet tall concrete wall. The third tier consisted of two 4x30x2-feet thick pads separated by a trough for the auger feeder that supplied the ovens with coal from the storage on the fourth tier. The 30x30-foot top tier of the facility was constructed of steel I beams and one 1/16-inch steel plate. The roof was 1/8-inch steel plate. The retaining wall on this level was 1/4-inch steel plate with angle iron supports.[19]

Situated approximately 600 feet northeast of the processing facility was the water tower. In excellent condition, the water tower was apparently still in use. The tank was 24 feet in diameter and 15 feet high, with approximately thirty 1/2-inch steel bands encircling it. The tank was supported by twenty-four concrete footings, 2-feet square by 8-feet long concrete pilings. The tank was enclosed in an octagonal wood structure with 12 feet long and 15 feet high walls on top of a 6 to 8 feet high concrste foundation. The structurs was topped by an octagonal roof covered with asphalt roofing. A 6x6x8-foot high alcove was attached to the south side of ths water tank enclosure.[20]

The remains of ths railroad that supplied the Eska Mine could be traced through the underbrush. The original narrow gauge track ran from the top level of the coal procsssing facility, up the east side of Eska Creek. The standard gauge track ran from Sutton, along Eska Creek, to the mine facilities and to the main portal.

The fan unit used to provide ventilation for the mine, the belt drive unit that operated the fan, and the dryer used to process the coal were removed from the mine at the time of reclamation in 1984. They are currently the main exhibits of the Sutton Outdoor Mining Museum at Sutton, Alaska. Although the equipment has been moved from its original setting, it remains as a physical reminder of the contribution of the Eska Mine.

At present, little evidence of the Eska mining operation exists on the site. The remaining evidence consists of two residences, the former repair/ssrvice shop and the water diversion systsm on the banks of Eska Creek. One residence, currently inhabited by Dennis Johnson, is situated 350 feet north of where the processing facility stood. The original wood frame structure is constructsd on a concrete foundation and covered with corrugated metal siding and roofing. An addition, added at an unknown date, is faced with plywood. The other residencs, which may have been the mine superintendent's house, is located 100 feet northwest of the site of the processing facility. The residence is of frame construction with an sxposed concrets bassment.[21]

The service/repair shop is situated three hundred feet east of the site of the main portal. The 2x4-inch wood frame structure is covered with galvanized tin siding and roofing. The foundation is poured concrete. Two small shed roofed outbuildings, one 19 feet by 7 inches, the other 10-1/2x20 feet, situated near the shop were removed at an earlier date.[22] A 2x2-inch and 4x4-inch wood

frame pump house on a concrete pad foundation still stands near the northeast corner of the service/repair shop.[23]

The water diversion facilities are situated on the banks of Eska Creek, some 300 feet above the bridge. The 8x8x12 feet cement block structure was used to divert water from Eska Creek to the watsr interceptor boxes situated behind the 6-foot high timber retaining wall. The retaining wall runs along the banks of the creek, from the cement structure to a point 150 feet downstream. The timbers of the box demolished in the reclamation project are situated 100 feet south of the cement structure. The other interceptor box is decaying in the ground 50 feet away.[24]

FOOTNOTES

1 For more information on this subject, refer to: Mary C. Bauer, A History of the Coal Mining in the Sutton-Chickaloon Area, Prior to World War II. (Alaska Historical Society Commission Studies in History #180), 1985; Michael Charlss Brown, The Alaska Railroad, Probing the Interior, (History and Archaeology Series #15, Alaska Division of Parks), 1975; Claude M. Naske and Don M. Triplehorn, The Federal Government and Alaska's Coal," Ths Northern Engineer, (Vol. 12, No. 3), 11-23; Vincent W. Ponko, Jr., The Alaska Coal Commission, 1920-22," The Alaska Journal, (Vol. 8, No. 2), 1978, 118-129.

2 For more information, refer to F. F. Barnes, Mining and Exploration in 1945
in the Wishbone Hill District, Matanuska Valley, Alaska; in F. F. Barnes and others, Coal Investigations in South-central Alaska, 1944-46, (U. S. Geological Survey #963-E, Washington, 1951); and in F. F. Barnes and T. G. Payne, The Wishbone Hill District, Matanuska Coal Fields, Alaska, (U. S. Geological Survey #1016, Washington, 1956).

3 Charles Michael Brown, The Alaska Railroad, Probing the Intsrior, (History and Archaeological Series #15, Alaska Division of Parks, 1975), 32.

4 Joshua Bernhardt, The Alaska Coal Commission, Its History, Activities and Organizations, (New York, D. Appleton & Co., 1952), 52.

5 William H. Wilson, Railroad in the Clouds; The Alaska Railroad in the Age of Steam, 1914-1945, (Boulder, Colorado, Pruett Publishing Co., 1977), 258.

6 M. R. Greer and F. H. Yancy, Washibility Characteristics and Washing of Coals from the Matanuska Field of Alaska, (U. S. Bureau of Mines Reports of Investigation #3840, Washington, 1962), 5.

7 For more information on the mining equipment, refer to International Library of Technology, (Multi-Volume, Scranton, International Text Book Co., 1920).

8 Greer, 5.

9 Ibid, 5.

10 Ibid, 5.

11 Ibid, 5.

12 Personal interview with Ernie Drager (McNally Pittsburg Co., Kansas City, Kansas)

13 Robert S. Warfield, Bituminous Coal Deposits of the Matanuska Coal Field, Alaska, (U. S. Bureau of Mines, Reports of Investigations #5950, Washington, 1962), 7.

14 For further information on this subject, refer to the Woodard-Clyde Consultants and Goodsen & Associates, Eska Mine, Reclamation Plan and Environmental Impact Assessment, (State of Alaska, Department of Natural Resources Report, 1984).

15 Ibid, 2-13.

16 Ibid, 2-15.

17 Ibid, 2-17.

18 Ibid, 2-17, 18.

19 Ibid, 2-18, 19.

20 Ibid, 2-16, 17.

21 Ibid, 2-20.

22 Ibid, 2-14.

23 Ibid, 2-13.

24 Ibid, 2-24.

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DRAWN BY: ROBERT A. MITCHELL, A.I.A.

NATIONAL ARCHITECTURAL AND ENGINEERING RECORD
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

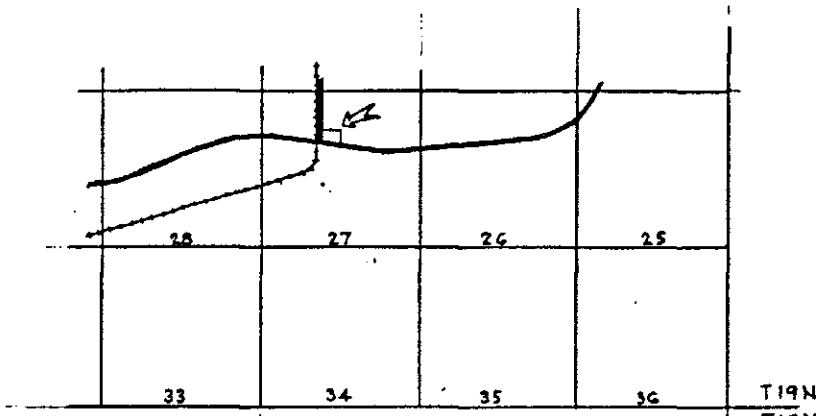
RELOCATION OF ARTIFACTS FROM ESKA & BUFFALO MINES TO THE ALPINE HERITAGE & CULTURAL CENTER: OUTDOOR MINING MUSEUM: SUTTON, AK.

NAME AND LOCATION OF STRUCTURE

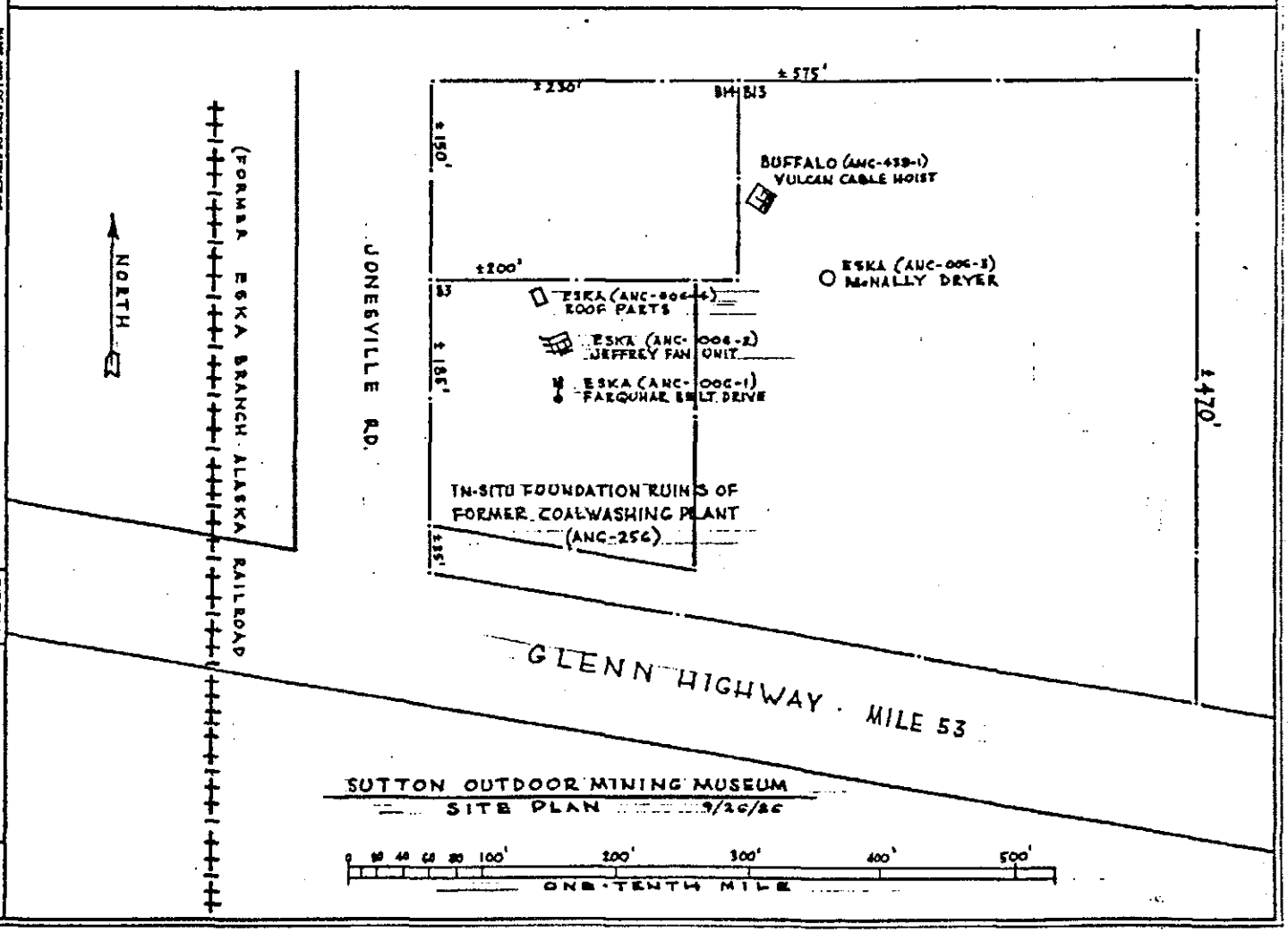
SURVEY NO.

HISTORIC AMERICAN BUILDINGS SURVEY

SHEET OF SHEETS



SUTTON VICINITY
(SEE USGS QUADR. MAP - ANCHORAGE C-6)



SUTTON OUTDOOR MINING MUSEUM
SITE PLAN 9/26/86

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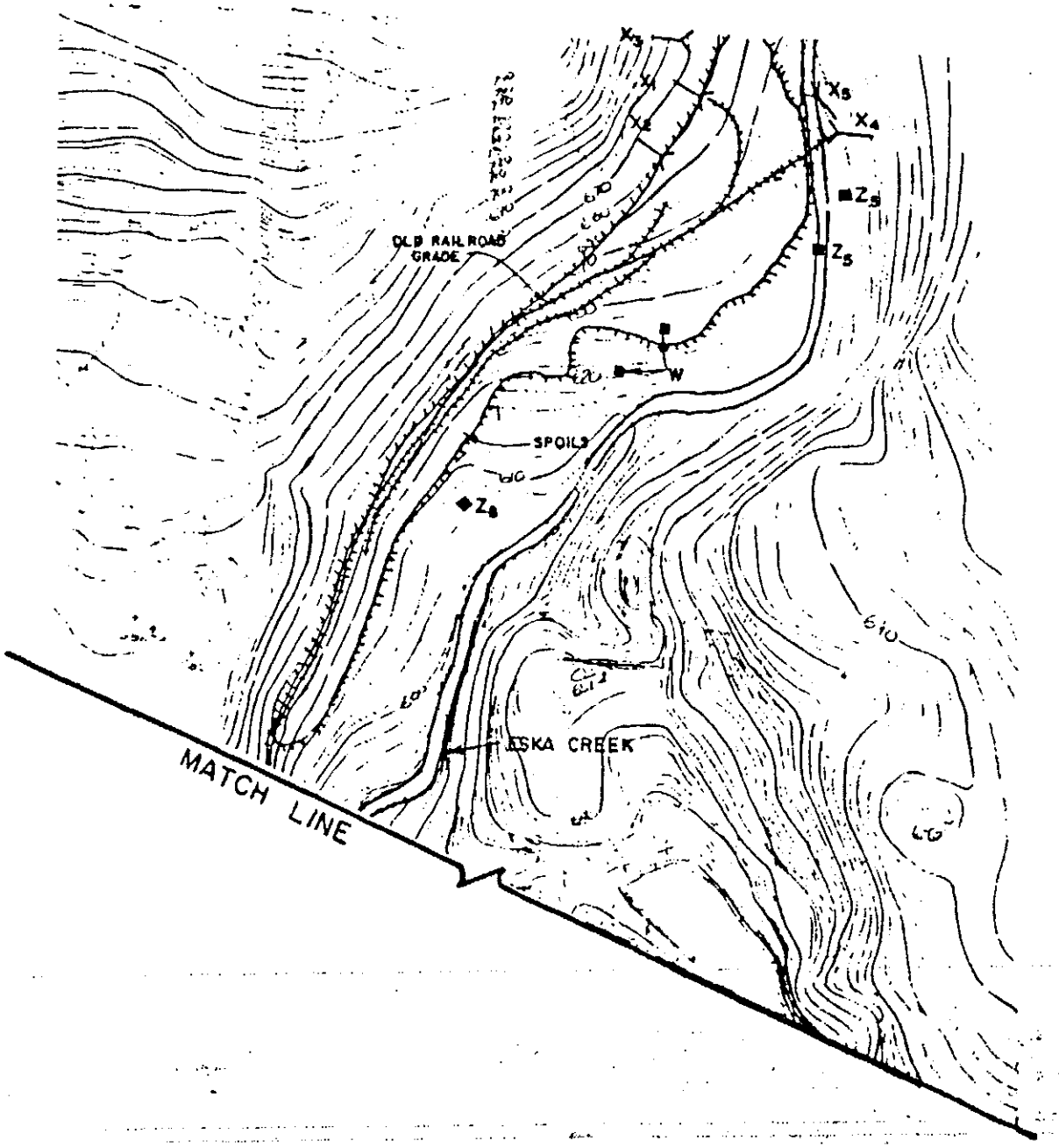
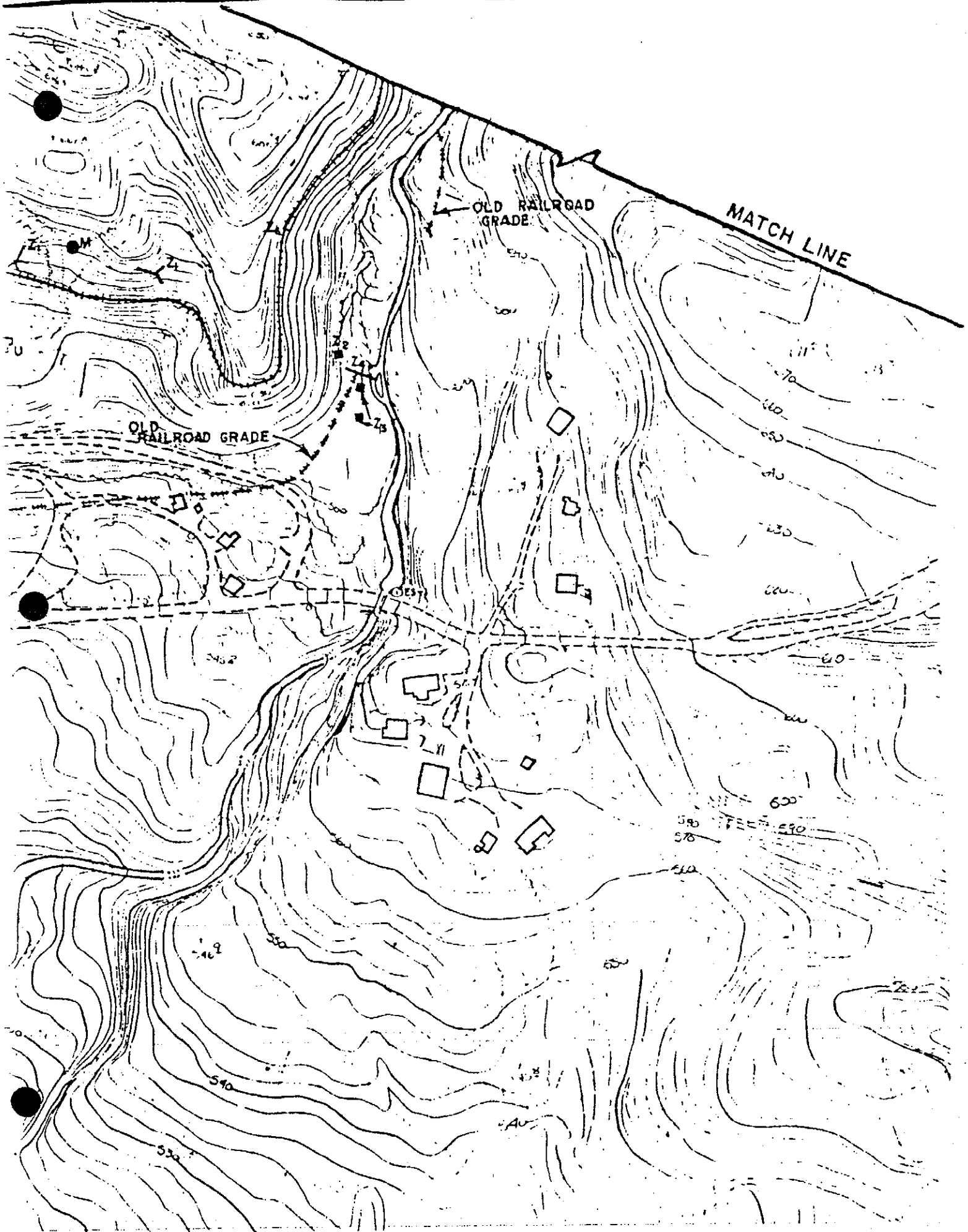
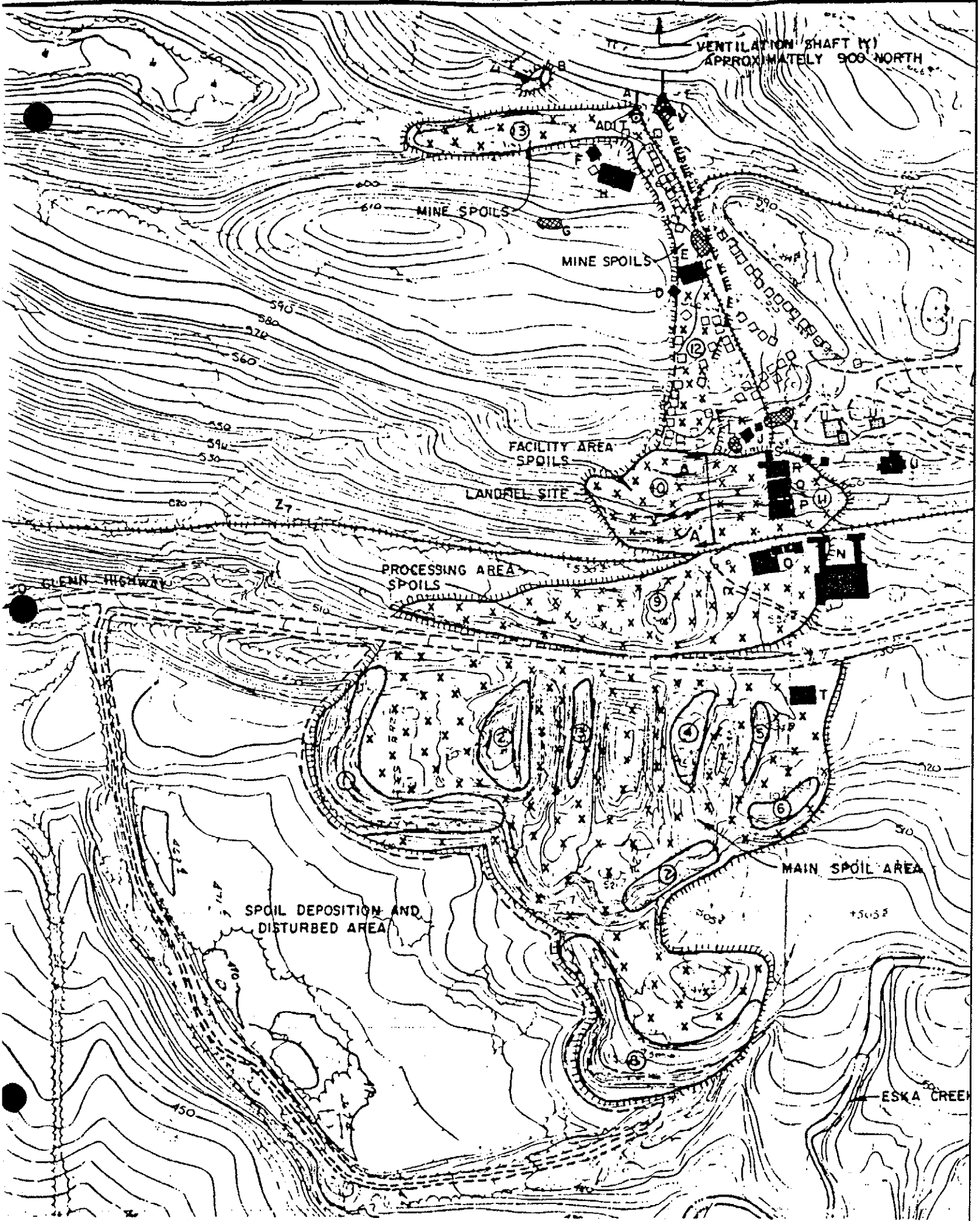
ONE-TENTH MILE



MINE FEATURES IDENTIFIED AND LOCATED BY WOODWARD-CLYDE CONSULTANTS AND GOODSON & ASSOCIATES.


OLD RAILROAD GRADE
MATCH LINE
OLD RAILROAD GRADE


VENTILATION SHAFT (V)
APPROXIMATELY 900 NORTH
ADIT
MINE SPOILS
MINE SPOILS
FACILITY AREA SPOILS
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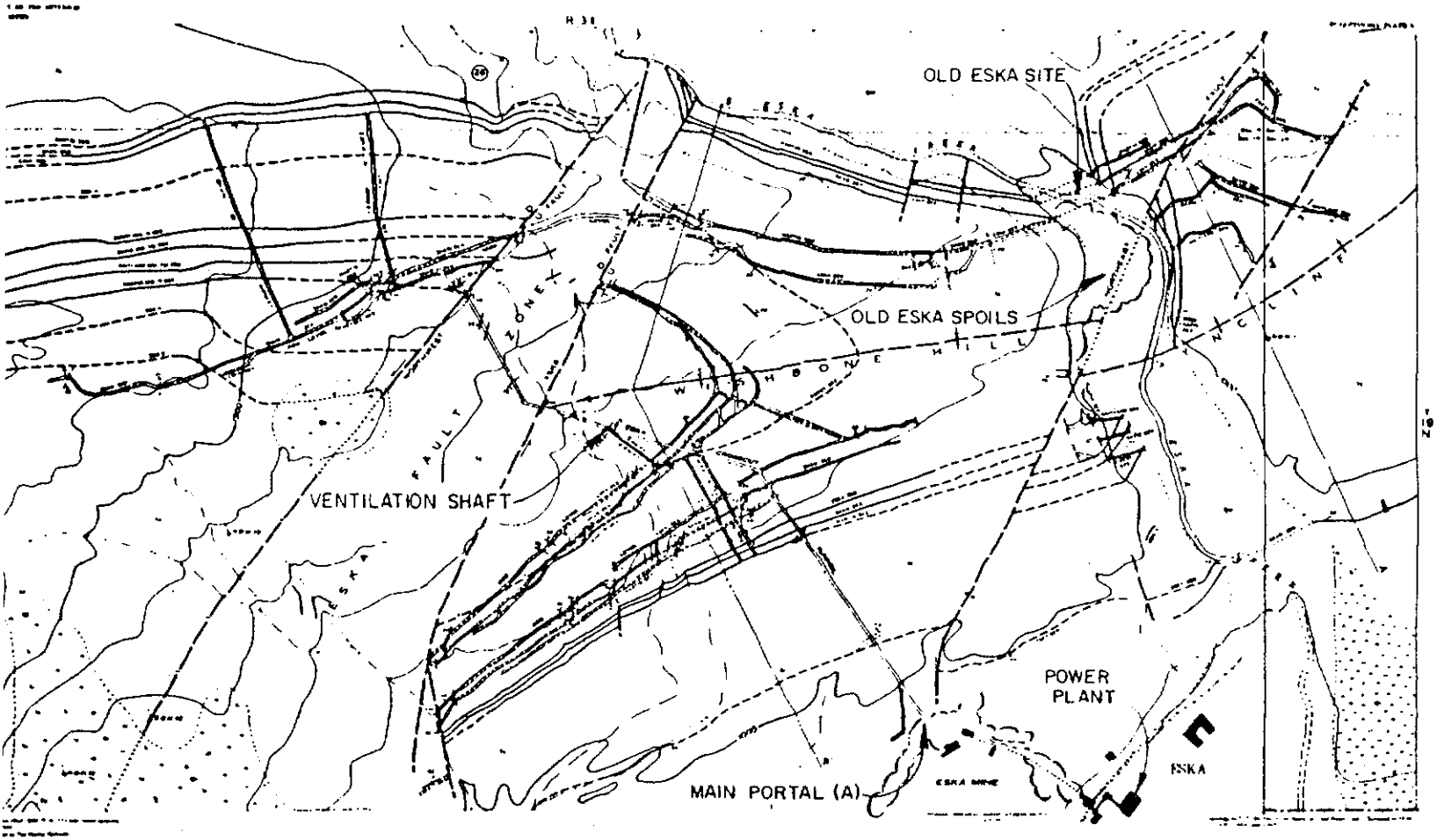
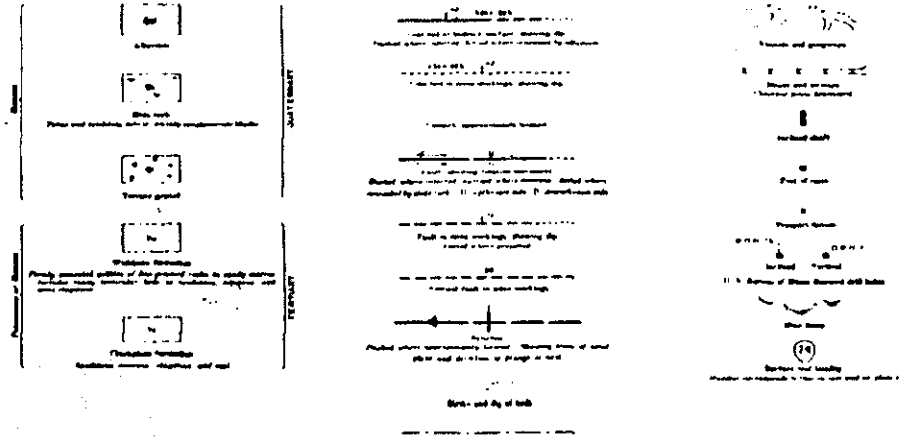
PROCESSING AREA SPOILS
GLENN HIGHWAY
MAIN SPOIL AREA
SPOIL DEPOSITION AND DISTURBED AREA
ESKA CREEK



GEOLOGIC MAP OF ESKA MINE AND VICINITY, WISHBONE HILL DISTRICT, MATANUSKA COAL FIELD, ALASKA

E X P L A N A T I O N



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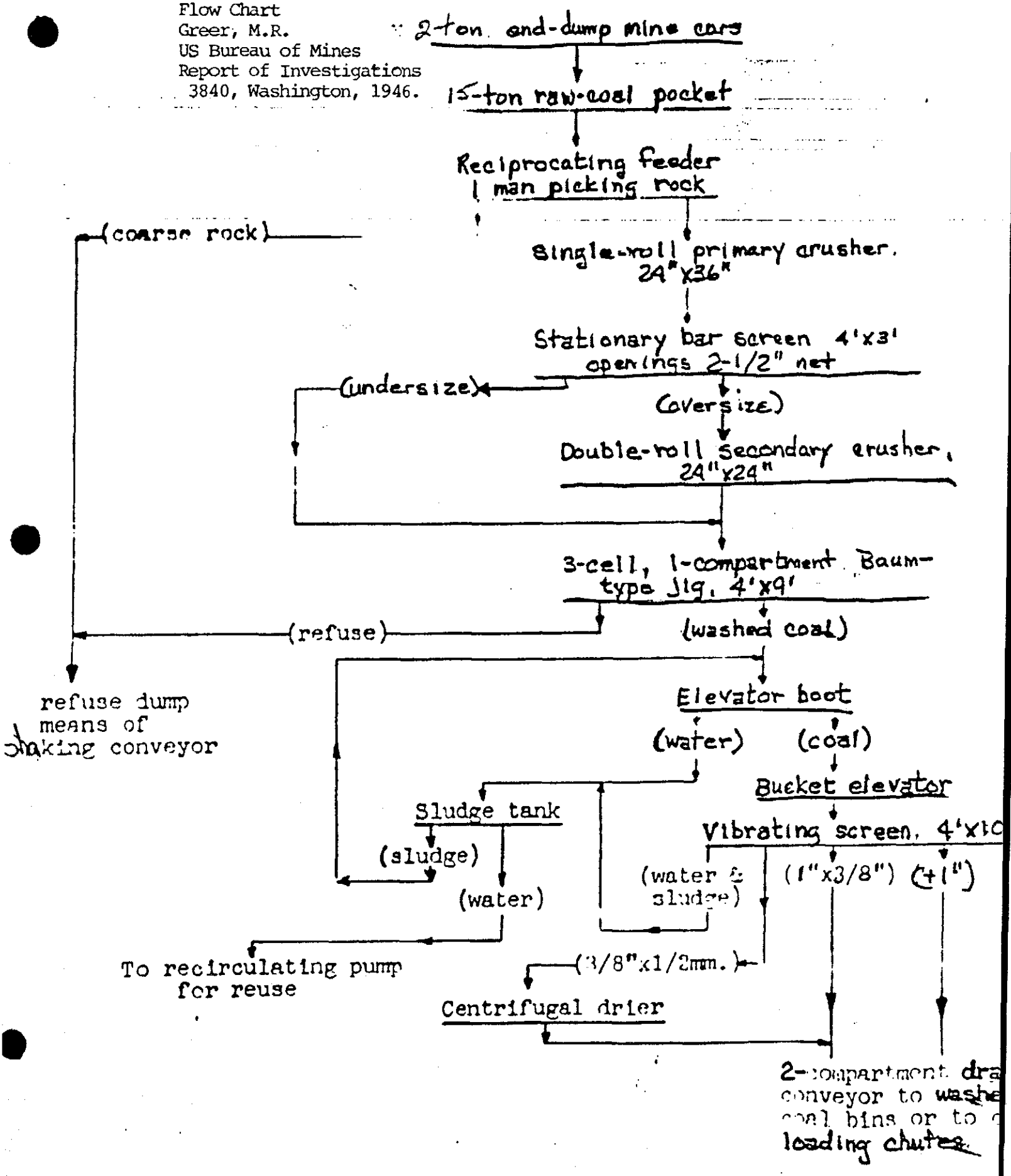
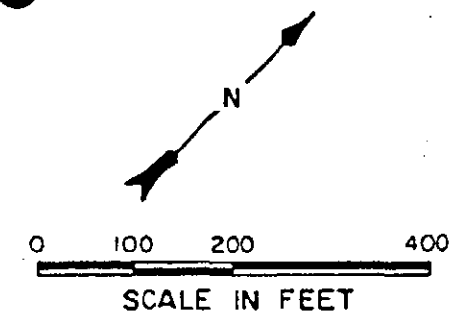
ESKA MINE
COAL DEVELOPMENT

1946 Eska Coal Mine
Flow Chart
Greer, M.R.
US Bureau of Mines
Report of Investigations
3840, Washington, 1946.





MINE RELATED STRUCTURES

OCCUPIED RESIDENCES

JUNK CARS

SPOIL AREA

ADIT

DEBRIS

SPOIL PILE PROBLEM AREA DESIGNATIONS

ES-1 WATER SAMPLE LOCATION

OLD RAILROAD GRADE

A - MAIN PORTAL /POWDER

B = FAN COMPLEX

C = REPAIR SERVICE SHOP

D = PUMP HOUSE

E = JUNK PILE

F = MISCELLANEOUS WOOD STRUCTURE

G = JUNK PILE

H = COMPRESSOR HOUSE

I = JUNK PILE (NORTH PILE)

J = SHED

K = WOOD SHED

L = WOOD PILE

M = WATER TOWER

N = POWER PLANT

O = COAL WASH FACILITY

P = UNDERGROUND STORAGE TIER

Q = PAD WITH FIRLBRICK OVENS

R = PAD WITH AUGER FEED

S = STORAGE BIN AND RETAINING WALL

T = CONCRETE PAD

U = ONSITE RESIDENCES

V = SPOOLS/DRYER

W = OLD ESKA BUILDING DEBRIS

X = OLD ESKA PORTALS

- X_1 MAIN OLD ESKA PORTAL
- X_2 OLD ESKA VENTILATION PORTAL
- X_3 PROSPECT PORTAL
- X_4 EAST PORTAL
- X_5 SHAW EAST PORTAL

Y = VENTILATION SHAFT (?)

Z = MISCELLANEOUS MINE FEATURES

- Z_1 PROSPECT PORTALS
- Z_2 WATER SYSTEM INTAKE HOUSE
- Z_3 WATER SYSTEM INTERCEPTOR BOXES
- Z_4 RETAINING WALL
- Z_5 CONCRETE BUILDING FOUNDATIONS
- Z_6 OLD ESKA NARROW GAUGE RAILROAD GRADE
- Z_7 STANDARD GAUGE RAILROAD GRADE
- Z_8 MINE CAR

ESKA MINE

SITE MAP