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FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM

ELIMINATION REPORT
FOR
BETHLEHEM STEEL CORPORATION
LACKAWANNA, NEW YORK

Department of Energy
Office of Nuclear Energy
Office of Remedial Action and Waste Technology
Division of Facility and Site Decommissioning Projects

CIRCA 6/85

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ELIMINATION REPORT
BETHLEHEM STEEL CORPORATION
LACKAWANNA, NEW YORK

INTRODUCTION

The Department of Energy (DOE), Office of Nuclear Energy, Office of Remedial Action and Waste Technology, Division of Facility and Site Decommissioning Projects (and/or predecessor agencies, offices and divisions), has reviewed the past activities of the Atomic Energy Commission (AEC) at the Bethlehem Steel Corporation, Lackawanna, New York, and completed radiological screening surveys at the site. DOE has determined that the conditions at this site are in compliance with current radiological guidelines and standards and that no potential for radiological exposure exists beyond that resulting from natural background. Therefore, this site requires no remedial action and will not be included in the Formerly Utilized Sites Remedial Action Program.

This report presents information supporting the determination that the radiological conditions at the Bethlehem Steel Corporation site are in compliance with current DOE radiological guidelines and standards¹ and provides assurance that use of the site will not result in any measurable radiological hazard to site occupants or to the general public.

This elimination report will be archived by DOE through the Assistant Secretary for Management and Administration. A copy of this package will be available for public review between 8:00 a.m. and 4:00 p.m., Monday through Friday (except Federal holidays), at the DOE Public Document Room located in Room 1E-190 of the Forrestal Building, 1000 Independence Avenue, SW., Washington, D.C.

¹ U.S. Department of Energy Guidelines for Residual Radioactivity at Formerly Utilized Sites Remedial Action Program and Remote Surplus Facilities Management Program Sites (Rev. 1, July 1985).

BACKGROUND

Site Function

In 1949, AEC contracted with Bethlehem Steel Corporation to develop mill pass schedules for the rolling of natural uranium billets into 1-1/2 inch rods to be used for reactor fuel rods. This work was conducted under contracts AT(30-1)-1279 and AT(30-1)-1156 (subcontract with National Lead of Ohio). All work was limited to weekends and involved only the 10-inch bar mill and associated billet preparation and handling equipment. Shipments of uranium billets were received from Mallinckrodt Chemical Company, St. Louis, Missouri, during the week and stored at the mill in rail cars. Following rolling, the material was bundled and returned to AEC. Material accountability procedures required collection of scale, residues, and cropped ends and vacuum cleaning of fine debris for return to AEC. AEC personnel were present during all rolling operations and apparently made radiological surveys and monitored Bethlehem Steel personnel. The project was completed in 1952. The data developed were used in the design of a rolling mill at the Feed Materials Production Center in Fernald, Ohio.

Site Description

The facilities owned and operated by Bethlehem Steel are located in Lackawanna, New York (see Figure 1). The 10-inch mill was in use for metal rolling operations during the August 1976 radiological screening survey, but has since been taken out of service and dismantled. Ancillary equipment, other than some rolls thought to have been used for uranium work, could not be located.

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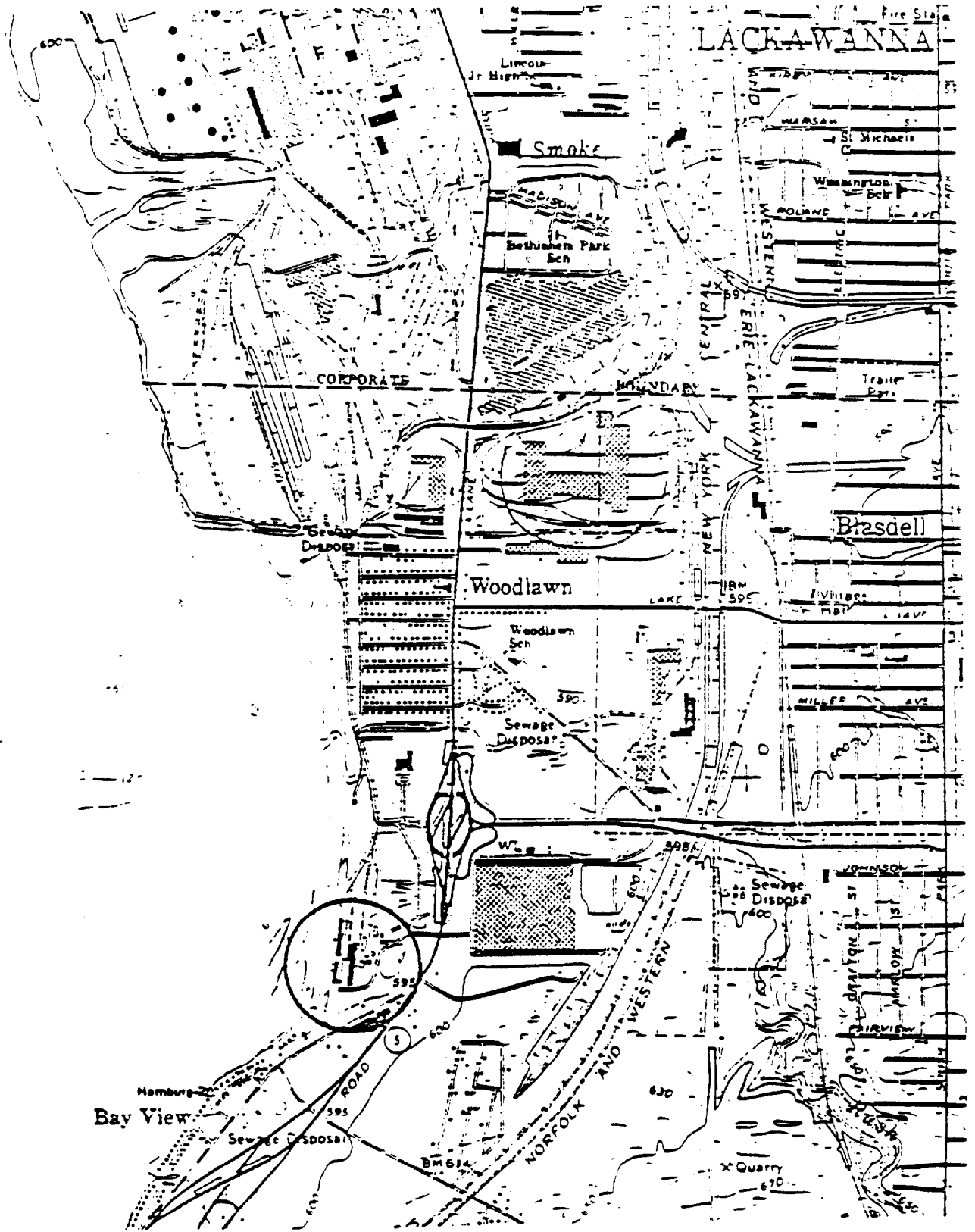


Figure 1. Location of the Bethlehem Steel Site
in Lackawanna, New York

Radiological History and Status

An alpha and beta-gamma smear survey conducted by Bethlehem Steel during May 1976 included the 10-inch bar mill and building surfaces in the area of uranium operations. No removable radioactivity was detected. On August 26, 1976, personnel from Oak Ridge Operations Office and Oak Ridge National Laboratory (ORNL) visited the site. They performed a radiological screening survey while the mill was in operation. The survey included direct measurement of alpha and beta-gamma radiation levels. No radioactivity above background levels was detected during this survey. Because no elevated radioactivity levels were detected and operations were on a limited developmental scale, it was concluded that no significant residual radioactivity from AEC contract operations exists at the site. In addition, when the equipment was not in operation, an additional radiological screening survey of the equipment was completed in September 1980. This followup survey also found no radiation levels significantly above background at the facility.

ELIMINATION ANALYSIS

Scrap recovery procedures in force at the time of the Bethlehem Steel rolling operations prevented the loss of any significant quantity of the metal. Radiological surveys of the plant area in which the rolling was performed and of the equipment used indicate that radiation levels are typical of natural background for the area. These data indicate that no significant quantity of residual radioactive material remains at this site from past Atomic Energy Commission operations. On the basis of the data summarized in this report, the DOE Division of Facility and Site Decommissioning Projects has determined that no remedial action is required at this site and has eliminated Bethlehem Steel's Lackawanna facility from further consideration under the Formerly Utilized Sites Remedial Action Program.

REFERENCES

- o Range, Wayne (Energy Research and Development Administration) to David M. Anderson (Bethlehem Steel Corporation), letter of June 7, 1976.
- o LaMastra, A. (Bethlehem Steel Corporation) to D.L. Webster (Bethlehem Steel Corporation), "Investigation Report: Uranium Metal Rolling, 10" Bar Mill, Lackawanna Plant," June 29, 1976.
- o Thornton, William T. (Energy Research and Development Administration), to R.H. Kennedy (Energy Research and Development Administration), "ERDA Resurvey Program - Bethlehem Steel, Lackawanna, New York," March 16, 1977.
- o Hollister, Hal (Energy Research and Development Administration), to William T. Thornton (Energy Research and Development Administration), "Bethlehem Steel, Lakawanna, New York," May 20, 1977.
- o Hart, R.J. (signing for C.A. Keller) (Energy Research and Development Administration) to D.M. Anderson (Bethlehem Steel Corporation), "Radiological Clearance: Facilities Operated Under Former AEC Contract," May 27, 1977.
- o Oak Ridge National Laboratory, "Preliminary Survey of Bethlehem Steel, Lackawanna, New York," March 1980.
- o Oak Ridge National Laboratory, "Survey of Rolling Mills Used by Bethlehem Steel Corporation, Lackawanna, New York," September 1980.

June 7, 1976

Mr. David M. Anderson, Manager
Environmental Quality Control
Bethlehem Steel Corporation
Martin Tower - Room B-252
Bethlehem, PA 18016

Dear Mr. Anderson:

This is a belated response to your letter of May 17 concerning the activities conducted for the Atomic Energy Commission at Bethlehem Steel's Lackawanna plant.

Our procedures for retention of records have resulted in the removal and destruction of files not specifically identified for historic purposes. We have, therefore, had to rely on the memory of those connected with the particular operation. In this case those recollections were available only from retirees. One retiree we discussed this with did in fact have a first hand knowledge of the operation because the contract and the development work were his prime responsibility. While his memory does not provide the scope and details you may desire, it may be helpful.

Beginning in approximately 1949, it was determined that the then current production rolling of uranium billets to rods left much to be desired in the percent reduction in the mill pass schedules. This regular production was not being performed at Bethlehem Steel but through contact with them it was determined that a suitable blooming mill and a suitable continuous mill existed for the necessary development work to identify required pass schedules. These would then be used as criteria for the design of the Fernald rolling mill which would be installed in 1952 and 1953.

To the best of our ability we have established that Bethlehem was given a contract for the necessary development of pass schedules and the work was accomplished in the period 1949 to 1951. Because this work was developmental in nature and the mills being used were already in full 5 day/wk. production use for non-uranium work, the uranium development work was limited to weekend operations. This meant billets were prepared by Mallinckrodt Chemical at St. Louis and shipped to Lackawanna in freight cars. These were spotted within the plant and served as the storage pending development rolling on the weekends. We are further told that the product rods

David M. Anderson, Manager -2-

June 7, 1976

were about 1½ inches in diameter and were cropped and packaged in bundles to prevent unnecessary damage by bending. Truck shipments of finished rods were considered normal but some rail shipments could also have been made.

The operations at Lackawanna were remembered as being quite clean. At the end of each campaign special care was taken to recover and package seals, crops and other residues. The extent to which air samples or surface contamination readings were taken is not known.

Because of the high value of the natural uranium metal accountability records were kept on each shipment and its resulting product return. These records have long since been destroyed. We do not believe there are any remaining records of the activities at Bethlehem's Lackawanna Plant within ERDA. It is quite probable that in the 1949 to 1951 time period much of the technical information developed was of a classified nature and for this reason was returned to the AEC. This work was done for the New York Operations Office of AEC and none of the information developed would now be classified in any way.

We regret that we cannot be of more assistance at this time. We anticipate that representatives of our Safety and Environmental Control Division will be in touch with you subsequently concerning a possible survey of the Lackawanna plant.

Sincerely,

Wayne Range
Assistant to Manager

bcc: ✓ W. H. Travis, ORO, w/cy incoming ltr.
H. D. Fletcher, ORO, w/cy incoming ltr.

June 29, 1976

FILE REF.

FROM A. LaMastra, Radiation Control Engineer
D. L. Webster, Chief Environmental Health Engineer
SUBJECT INVESTIGATION REPORT: URANIUM METAL ROLLING,
10" BAR MILL, LACKAWANNA PLANT

3/12/77

General Information

On May 7, 1976 an article appeared in the Buffalo Courier Express listing Bethlehem Steel Corporation's Lackawanna Plant as one of several facilities which handled radioactive material for the U. S. Atomic Energy Commission (AEC) during the late 1940's and early 1950's. The U. S. Energy Research and Development Administration (ERDA), formerly the research and development arm of the AEC, had developed a list of 49 sites for which only incomplete records existed. Lackawanna was one of the 49 sites. The initial story was reported by the Washington Star and subsequently picked up by the Buffalo paper. The report in the Star indicated that Federal experts were surveying for possible contamination from lax handling methods, for material possibly buried at the sites, and for possible spreading to other sites.

An investigation by this Division was begun on May 10 along several independent avenues. The following is a summary of the information and recollections we have been able to assemble from Lackawanna Plant employees, from a letter from ERDA (Oak Ridge Operations, letter attached herewith), and from an extensive contamination survey of the 10" Bar Mill.

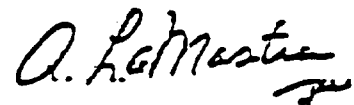
In 1949, the U. S. AEC was developing mill pass schedules for the rolling of natural uranium billets produced by Mallinckrodt Chemical, St. Louis, Missouri, into 1½-inch rods. The rods were to be used as fuel rods in nuclear reactors. The AEC gave a contract to Bethlehem Steel to develop the necessary pass schedules. All work was completed between 1949 and 1951. The information gained at Lackawanna was used by the AEC in designing a rolling mill at the National Lead Company plant in Fernald, Ohio which began production in 1953.

All developmental work at Lackawanna was limited to weekends. Shipments were received from Mallinckrodt during the week and stored at the mill building. Following rolling, the rods were packaged in bundles and shipped to the AEC. No definitive records of the operations have been found either in former AEC files or at Lackawanna or in Corporate files. According to comments received from National Lead personnel, from a former superintendent of the 10 and 12-inch Bar Mill at Lackawanna, and from ERDA, the Lackawanna rolling was considered "clean". Scale, residue and cropped ends were collected and fine debris was vacuumed. AEC personnel were in attendance during all rolling operations and reportedly performed air and surface radioactive monitoring. It was also indicated that the AEC checked the personnel involved in the rolling for any contamination. (No records are available of this. If records ever did exist, they have not been retained by ERDA.)

equipment were tested for radioactive contamination using dry wipes. On May 17, 12 additional rolls for the 10-inch mill, some of which are believed to date back to the time of subject rolling, were found and wiped. All samples were analyzed for both alpha and beta radiation using an internal gas flow proportional counter. No radioactive contamination above natural background was found on any wipe.

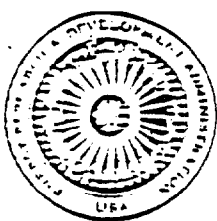
Results and Conclusions

1. Although there is a lack of past monitoring records and most of the available information is from the recollection of persons involved, it does not appear that a significant health hazard from radioactivity existed at Lackawanna at any time during or following this project.
2. The high monetary value and the military use of the uranium would result in a high degree of accountability. This would substantiate the extensive clean-up measures taken during the rolling operations.
3. In an intensive survey made subsequent to the news item, no radioactive contamination was found in the mill used during the project.
4. No records have been discovered which describe health physics activities performed during the project. Further inquiry is being made to the U. S. Nuclear Regulatory Commission's New York Office.
5. In summary, there is no evidence to indicate that handling and cleanup methods were lax during the Lackawanna rolling operation, that there is any of the uranium buried on Lackawanna property or in the Buffalo area as a result of the rolling operation, or that there was a spread of contamination to any areas. There is no evidence to indicate that any person has ever been significantly exposed to radiation from this operation. All evidence found thus far indicates that there is no hazard at this operation from radioactive materials.



A. LaMastra

AL:ws



UNITED STATES
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

OAK RIDGE OPERATIONS
P. O. BOX E
OAK RIDGE, TENNESSEE 37830

AREA CODE 615
TELEPHONE 482-86

March 16, 1977

Assistant Director for Health Protection, DSSC-HQ
ATTN: R. E. Kennedy, DSSC-HQ

ERDA RESURVEY PROGRAM - BETHLEHEM STEEL, LACKAWANNA, NEW YORK

On August 26, 1976, E. W. Dickson of ORNL and I visited the Lackawanna Plant of Bethlehem Steel to make an assessment of the radiological status of facilities utilized during 1949-51 for AEC contract work involving uranium. Discussions were held with Mr. Anthony LaMastra, the company health physicist, and others who were familiar with equipment and plant areas involved in the AEC operations. Following is a statement of findings:

Operations History: In 1949 the AEC, in order to develop mill pass schedules for the rolling of natural uranium billets into 1-1/2" rods, awarded a contract to Bethlehem Steel. The rods were to be used as reactor fuel. All work at Lackawanna was limited to weekends and involved only the 10-inch bar mill and associated billet preparation and handling equipment. Material accountability procedures required collection of scale, residues, and cropped ends and vacuuming of fine debris for return to AEC.

Current Status of Facilities: The 10-inch mill continues to be used for metal rolling operations. Ancillary equipment, other than some rolls thought to have been used for uranium work, could not be located.

Radiation Survey Findings: An alpha and beta-gamma smear survey conducted by Bethlehem during May 1976 included the 10-inch bar mill and building surfaces which were in the area of uranium operations. No removable radioactivity was detected. A copy of the Bethlehem report is in our facility file. During our August 26 visit, direct measurement of alpha and beta-gamma radiation levels were also made in these areas and revealed no radioactivity above background levels.

Conclusion: Since no elevated radioactivity levels were detected and since operations were on a limited developmental scale, it is concluded that no significant radioactive residual from AEC contract operations exists at the site.

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Handwritten notes:
see serial
see document
attached
R. E. Kennedy
3/16/77

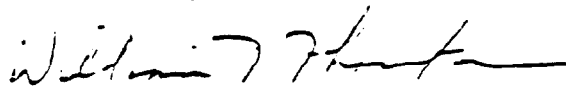


March 16, 1977

Recommendation. It is recommended that no further radiation surveys be made at the Lackawanna site.

Upon HQ concurrence with the above recommendation, the enclosed letter will be sent to Bethlehem Steel.

Sincerely,

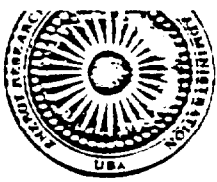


William T. Thornton
Health Protection Branch
Safety and Environmental Control Division

OSE:WTT

Enclosure:
Draft Letter

cc: J. W. Range, FIC
W. H. Travis, S&EC




ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
WASHINGTON, D.C. 20545

MAY 20 1977

William T. Thornton
Health Protection Branch
-- Safety and Environmental
- Control Division
Oak Ridge Operations Office

BETHLEHEM STEEL, LACKAWANNA, NEW YORK

Based upon the findings indicated in your letter report of March 16, 1977, we see no problem with your conclusion and agree with your recommendation that no further radiological surveys are necessary at the Lackawanna plant.


Hal Hollister, Acting Director
Division of Operational and
Environmental Safety

cc: W. McCann, OPA
W. Brown, OGC

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MAY 25 1977

MAY 27 1977

Dr. D. H. Anderson
Manager, Environmental Quality Control
E-252
Martin Tower
Bethlehem Steel Corporation
Bethlehem, Pennsylvania 18016

Dear Dr. Anderson:

RADIOLOGICAL CLEARANCE: FACILITIES OPERATED UNDER FORMER AEC CONTRACT

In May 1976 several sites were identified in the press as locations being reviewed by ERDA to reassess the significance of any radioactivity which might have been left at the conclusion of work under an Atomic Energy Commission contract. "Bethlehem Steel, Buffalo (Lackawanna) New York" was one of the sites so identified.

Based on radiation measurements made by Bethlehem Steel and confirmed during a visit by ERDA representatives to the Lackawanna Plant on August 26, 1976, it is concluded that no potential for radiation-related safety problems exists in the involved facilities and that further formal ERDA radiation surveys are not warranted.

May I express sincere regret for any inconvenience or apprehension caused your company or its employees in this matter. If you request, a press release will be issued in the Buffalo, New York area clearing the Bethlehem Steel Plant.

If you have questions on this matter, do not hesitate to call Mr. W. T. Thornton of my staff (615) 483-8611, extension 3-4113.

Your assistance in this matter is greatly appreciated.

Sincerely,

ORIGINAL SIGNED BY
Charles A. Stetler
Manager

for

CSH:WET

cc: J. W. Rango, PIO
W. E. Travis, SAEC

OFFICE	<i>H. B.</i>	<i>S-50</i>	<i>S. P.</i>	<i>AKC</i>		
SURNAME	<i>Flanagan</i>	<i>H. M. L.</i>	<i>[Signature]</i>	<i>Kelen</i>		
DATE	<i>5/25/77</i>	<i>5/26/77</i>	<i>5-25-77</i>	<i>5/26/77</i>		

PRELIMINARY SURVEY OF
BETHLEHEM STEEL
LACKAWANNA, NEW YORK

Work performed
by the
Health and Safety Research Division
Oak Ridge National Laboratory
Oak Ridge, Tennessee 37830

March 1980

OAK RIDGE NATIONAL LABORATORY
operated by
UNION CARBIDE CORPORATION
for the
DEPARTMENT OF ENERGY
as part of the
Formerly Utilized Sites--
Remedial Action Program

BETHLEHEM STEEL
LACKAWANNA, NEW YORK

At the request of the Department of Energy (DOE, then ERDA), a preliminary survey was performed at the Bethlehem Steel Corporation's plant in Lackawanna, New York (see Fig. 1), on August 26, 1976, to assess the radiological status of those facilities utilized under Atomic Energy Commission (AEC) contract during the period 1949 through 1951. Anthony LaMastra of Bethlehem Steel, who was in charge of radiation safety, provided information about the project, and John Baker assisted in conducting a tour of facilities. R. H. Custer, who was employed at the plant at the time of the project, also provided useful information about the project.

From discussion and review of correspondence related to the project, it appears that the AEC awarded a contract to Bethlehem Steel Corporation in 1949 to develop mill pass schedules for the rolling of natural uranium billets into 3.8-cm rods. The rods were to be used as reactor fuel. The billets were produced and received by rail car from Mallinckrodt Chemical of St. Louis, Missouri. Rolling operations involving uranium were conducted only on weekends due to work commitments at the mill during the weekdays. Rail cars containing billets were believed to have been spotted inside the plant and served as storage for the uranium during the weekdays. These billets were then processed into 3.8-cm-diam rods, cropped and packaged in bundles to reduce bending damage, and shipped. Apparently, all scale, residue, and cropped ends were collected and fine debris was vacuumed as the mills were prepared for other work each week. Even though it appears that AEC personnel were present during the rolling operations, and radiological surveys were conducted, no records are available presently.

Present Use of Facilities

The 25.4-cm rolling mill used in contract work continues to be used for metal rolling operations. Any other ancillary equipment which may have been associated with the project was not located during the survey.

Results of Preliminary Survey

The preliminary survey was conducted by H. W. Dickson of the Oak Ridge National Laboratory and W. T. Thornton of the DOE/Oak Ridge Operations Office. A survey of the 25.4-cm mill and areas surrounding the mill was performed. The survey consisted of direct measurements of alpha activity and beta-gamma dose-rate levels on surfaces. Measurements were made with portable alpha scintillator and Geiger-Mueller survey instruments. All measurements taken at this site resulted in radiation levels that were within typical background levels. Additionally, on May 11, 1976, Anthony LaMastra of Bethlehem Steel Corporation (a health physicist) performed a radiological survey for removable radioactive contamination from the same locations. The results of that survey are contained in the attached report. It was concluded that levels of radioactivity at the Bethlehem Steel plant in Lackawanna, New York, are within available guidelines for unrestricted use and no further DOE survey is recommended.

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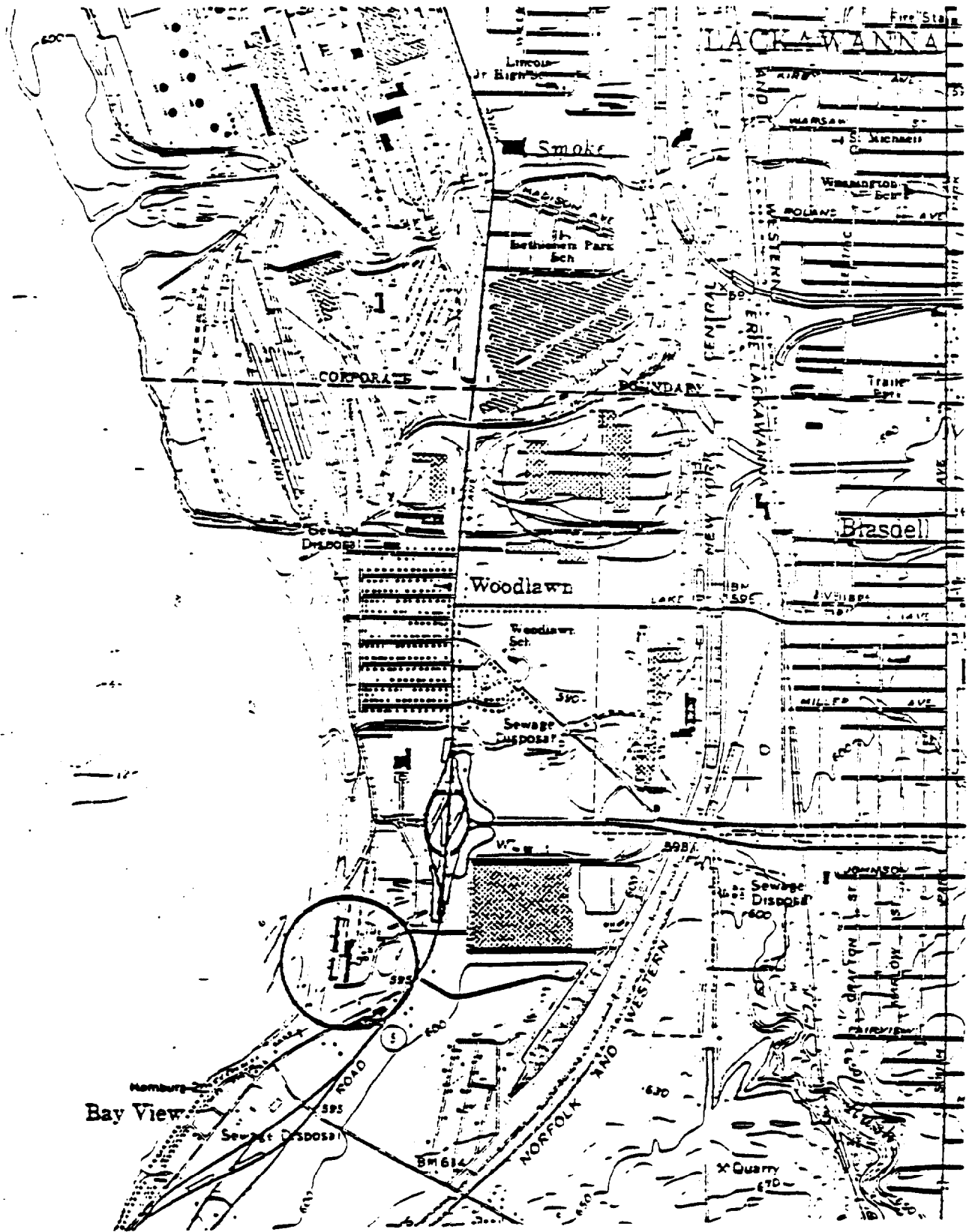


Fig. 1. Location of the Bethlehem Steel site in Lackawanna, New York.

SURVEY OF ROLLING MILL USED BY
BETHLEHEM STEEL CORPORATION
LACKAWANNA, NEW YORK

Work performed
by the
Health and Safety Research Division
Oak Ridge National Laboratory
Oak Ridge, Tennessee 37830

September 1980

OAK RIDGE NATIONAL LABORATORY
operated by
UNION CARBIDE CORPORATION
for the
DEPARTMENT OF ENERGY
as part of the
Formerly Utilized Sites--
Remedial Action Program

SURVEY OF ROLLING MILL USED BY
BETHLEHEM STEEL CORPORATION
LACKAWANNA, NEW YORK

A radiological survey was conducted at the Bethlehem Steel Corporation Plant in Lackawanna, New York, on September 23, 1980, by representatives of Oak Ridge National Laboratory (ORNL). The subject of the radiological survey was a portion of the original 25.4-cm (10-inch) bar mill used in converting uranium billets into 3.8-cm rods. All radiation survey measurements taken during an earlier survey (see attachment, "Preliminary Survey of Bethlehem Steel, Lackawanna, New York") were within typical background levels. However, it was believed that a more detailed survey of the bar mill would be desirable.

The following conditions were present at the site of the bar mill at the time of the present survey: (1) the original bar mill used at the time of Atomic Energy Commission (AEC) activities was stored as scrap and was removed for recycling within the last six months; (2) the floor and pit where the bar mill was located during operations was covered by a new concrete floor varying in thickness up to a maximum of approximately 1 m; (3) the stand and shoe plates associated with the bar mill were removed and scrapped. The only remaining equipment at the Lackawanna Plant used during AEC activities is a shear used for cropping the 3.8-cm uranium rods. However, the shear was not located in its original location at the time of AEC-related operations.

Survey Results

A radiological survey was performed on the surfaces of the shear. Measurements included a gamma-scan of all accessible equipment surfaces, a beta-gamma scan of selected equipment surfaces, and alpha activity at random locations on equipment surfaces. All measurements taken of equipment surfaces resulted in no radiation levels significantly above background levels.

Conclusions

Since all radiological measurements taken at the Bethlehem Steel Corporation Plant in Lackawanna, New York, have resulted in radiation levels within background levels, it is concluded that no present or potential radiation-related health hazards exists due to previous AEC-related activities. It is recommended that no further Department of Energy (DOE) radiological surveys be performed at this site and that it is released by DOE for unrestricted use.