Top Secret

[redacted]

DIRECTORATE OF
INTELLIGENCE

Industrial Facilities
(Non-Military)

# *Basic Imagery Interpretation Report*

## Chin-hsi Petroleum Refinery

## Lien-shan, China

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DATE JUNE 1969
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# TOP SECRET RUFF

RCS - 13/0186/69

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CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
Imagery Analysis Service

| INSTALLATION OR ACTIVITY NAME | | | COUNTRY |
|---|---|---|---|
| Chin-hsi Petroleum Refinery | | | CH |
| **UTM COORDINATES** | **GEOGRAPHIC COORDINATES** | | **WAC-PIC N** 25X1 |
| 51TUF172103 | 40-44-18N 120-49-58E | | 0289-191 |

**MAP REFERENCE**
15th RTS. USATC 200, Sheet M0289-24HL, 3rd edition, Sep 66, Scale 1:200,000
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| LATEST IMAGERY USED | NEGATION DATE (If required) |
|---|---|
| [redacted] | Not Required |

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## ABSTRACT

This report provides a detailed imagery-derived analysis of the Chin-hsi Petroleum Refinery from August 1962 to November 1968. The Chin-hsi refinery was originally designed to produce and refine synthetic oil. The synthetic oil production facilities were never completed, however, and when the refinery was completed during World War II it was utilized to process crude oil. At present, its major products are straight-run, cracked and blended gasolines, kerosene, diesel and fuel oil, and residuum.

This report includes a detailed line drawing and photograph of the refinery, mensuration of storage tanks, a discussion of physical features and operational functions, a chronology of construction activity and status, and reference data.

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Approved For Release 2008/06/18 : CIA-RDP79T00909A000500010017-3

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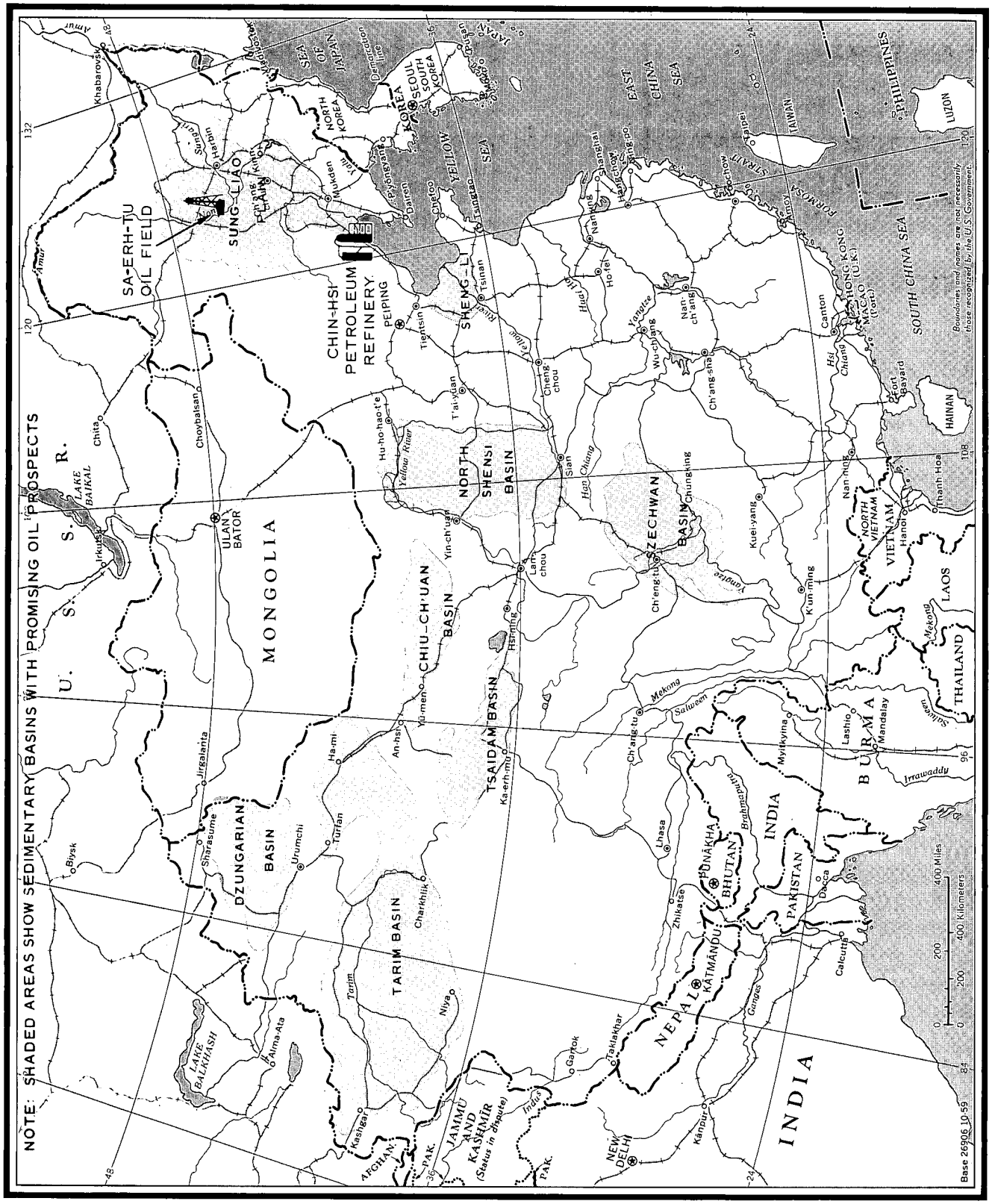


*FIGURE 1. LOCATION MAP*



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## INTRODUCTION

The Chin-hsi Petroleum Refinery is located in an industrial complex in the southwestern outskirts of Lien-shan (Chin-hsi), in Liaoning Province. The refinery was originally designed to produce and process synthetic oil, but the synthetic oil production facilities were never completed. When the refinery was completed during World War II it was utilized to process crude oil.1/ Reportedly it now processes crude oil from the Sa-erh-tu Oil Field.3/ The refinery is served by a good all-weather road system and by a spur from the main railroad leading south from Chin-hsi. A pipeline which reportedly connects the refinery with the port facilities at Hu-lu-tao, 2/ 20 nm to the east, cannot be identified on photography.

The Lien-shan Thermal Power Plant, Army Fuel Depot ( 25X1
which furnishes electric power to the refinery is collocated with it. Those facilities at the refinery which were originally designed to produce synthetic oil are identified in the Basic Encyclopedia as the Lien-shan Gas Plant, New 25X1

## BASIC DESCRIPTION

### Physical Features

The refinery area is irregularly shaped, measures about 7,500 by 3,500 feet, and occupies approximately 600 acres.

The plant is secured on three sides by a fence, and shares common security with the Chin-hsi Chemical Plant on the fourth side.

### Operational Functions

The major products of the refinery include straight-run, cracked, and blended gasolines, kerosene, diesel and fuel oil, and residuum. It possibly produces higher octane gasoline, hydrogen, and aromatics.

The major refinery components found at this plant are multistage distillation equipment for fractionation of crude oil, cracking units, and possibly reforming and gas processing equipment.

### Construction Status and Activity

August 1962 -- The refinery appeared basically complete. Facilities included a shell still, a single stage distillation unit, two multistage distillation units, two thermal cracking units, a low temperature carbonization plant, a steam plant, and a thermal power plant. Construction was underway on the crude oil storage reservoirs in Areas J and U. All units appeared to be operating except the two multistage distillation units.

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May 1963 -- Construction had begun on the possible gas processing unit and several tanks were completed in storage areas Areas I and J. All of the processing units appeared to be operating.

October 1963 -- Construction was underway on the U/I processing unit (Area D), the possible reform unit (Area E), the cooling facilities (Area A), and the transfer facilities in Area C. Two new tanks had been built in the intermediate and products storage area (Area I). The refinery appeared to be operating.

January 1966 -- Two unidentified processing units (Areas L and M), the intermediate storage facilities (Area K), the possible reforming facilities, the gas processing facilities, and two crude oil storage reservoirs had been completed since 1963. In addition the conveyor serving the low temperature carbonization plant had been removed. All processing areas appeared to be operating with the exception of the low temperature carbonization plant.

October 1966 -- No significant changes were noted. All units appeared to be operating.

March 1967 -- Partial coverage of poor quality showed that the roof of the retort building of the low temperature carbonization plant had been removed. The rest of the refinery was operating.

May 1967 -- The U/I processing unit (Area D) appeared to be complete and in operation.

December 1967 -- Partial coverage showed disruptive painting on several storage tanks in the thermal cracking and crude storage areas (Areas R and V), and several personnel trenches had been dug in the crude storage area. Those portions of the refinery covered appeared to be operating.

November 1968 -- No major changes to the refinery were observed on small-scale photography. The processing units appeared to be operating.

Facilities and Equipment

The following table lists the functional areas and equipment within the refinery. All items are keyed to Figure 3.

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EQUIPMENT AND FACILITIES AT THE CHIN-HSI PETROLEUM REFINERY

| Area | Description | Equipment* |
|---|---|---|
| A | Cooling Facilities | 4 Induced-draft cooling towers with 4 cells each<br>1 Compressor/pumping building<br>1 Water pond<br>1 Cylindrical tank<br>[redacted] 25X1<br>1 Miscellaneous building |
| B | Unidentified Processing | 1 U/I processing unit<br>1 Pipe furnace<br>1 Possible compressor/control building<br>2 Rail-served transloading buildings<br>3 Miscellaneous buildings |
| C | Transfer Facilities | 1 Loading rack (not shown on graphic)<br>1 Loading building served by 2 rail spurs<br>2 Pumping buildings<br>6 Miscellaneous buildings<br>34 Cylindrical tanks<br>[redacted] 25X1<br>8 Horizontal tanks<br>[redacted] 25X1 |
| D | Unidentified Processing | 8 U/I processing columns/reactors<br>1 Possible pipe furnace<br>1 Possible compressor/control building<br>4 Banks of possible heat exchangers/ cooling coils<br>6 Miscellaneous buildings<br>31 Cylindrical tanks<br>15 diam. 25 ft.<br>16 diam. [redacted] 25X1 |

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| Area | Description | Equipment* |
|---|---|---|
| E | Possible Reforming | 1 Possible reform unit with<br>8 columns/reactors<br>4 Petrochemical furnaces<br>2 Small banks of heat exchangers<br>1 Bank of accumulators<br>1 Compressor building<br>4 Miscellaneous buildings<br>5 Cylindrical tanks<br>3-20 ft. diam.<br>2-10 ft. diam. |
| F | Possible Gas Processing | 1 Main processing unit with at least 3 columns enclosed by scaffolding<br>5 Possible reactors in a row<br>1 Possible small reactor<br>2 Banks cooling coils<br>1 U/I processing building with 2 possible fractionators/extractors<br>2 Compressor/pumping buildings<br>2 Control houses<br>1 Large monitor roofed building with associated bank of cooling coils and a control building |
| G | Crude Oil Distillation | 1 Crude oil distillation unit with<br>1 Fractionator<br>1 Pipe furnace<br>1 U/I column<br>1 Bank of cooling coils<br>1 Compressor building<br>1 Pumping building<br>4 Unidentified buildings (one with two pieces of unidentified processing equipment)<br>29 Cylindrical tanks<br>23 diam. 25 ft. |
| H | Engineering and Support | 10 Engineering and support type buildings<br>Numerous smaller buildings (not shown on graphic)<br>Large amounts of construction material stockpiled at various points throughout the area |

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| Area | Description | Equipment* |
|---|---|---|
| I | Intermediates and Products Storage | 37 Cylindrical tanks<br>25X1<br>2 Pumphouses<br>1 Miscellaneous building |
| J | Products Storage | 1 Semiburied reservoir 130 x 90 feet<br>11 Cylindrical tanks<br>25X1 |
| K | Intermediates Storage | 25 Cylindrical tanks<br>25X1 |
| L | Unidentified Processing | 1 U/I processing unit with at least 14 U/I reactors/columns<br>2 Banks of heat exchangers/cooling coils<br>1 Large U/I processing building<br>4 Miscellaneous buildings<br>3 Cylindrical tanks<br>25X1 |
| M | Unidentified Processing | 1 U/I processing unit with<br>2 Processing columns<br>1 Petrochemical furnace<br>1 Compressor building<br>1 Bank heat exchangers/cooling coils/accumulators<br>3 U/I buildings<br>1 Water pond<br>5 Cylindrical tanks<br>25X1 |

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| Area | Description | Equipment* |
|---|---|---|
| N | Lien-shan Gas Plant (New) | a. Low temperature carbonization plant, currently being dismantled<br>b. Reported location of gas purification plant, current function unknown<br>c. Incomplete water gas facility<br>d. Probable former electrolysis building, current function unknown<br>e. 1 Possible catalyst regeneration facility<br>Former hydrogenation plant (main building Area L) currently an U/I processing building<br>1 Steam plant<br>1 U/I furnace<br>2 Pipe furnaces<br>1 Gasholder<br>1 Cooling tower and one spray pond probably used in support of power plant (Area O)<br>12 Cylindrical tanks<br>8 diam. 40 ft.<br>4 diam. 20 ft.<br>9 Miscellaneous buildings |
| O | Lien-shan Thermal Power Plant Army Fuel Depot | 1 Boilerhouse<br>1 Generator hall<br>1 Control house<br>2 Miscellaneous buildings<br>2 Venturi cooling towers<br>1 Spray pond<br>9 Cylindrical tanks<br>20 ft. diam. |
| P | Crude Oil Distillation | 2 Multistage distillations units each having<br>1 Atmospheric distillation column<br>1 Vacuum distillation column<br>2 Probable re-distillation columns<br>2 Pipe furnaces<br>2 Banks heat exchangers<br>1 Compressor building<br>1 Control building<br>2 Additional distillation columns serve both units |

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| Area | Description | Equipment* |
|---|---|---|
| P | Crude Oil Distillation - Continued | 1 Pipe furnace<br>5 Associated buildings<br>19 Cylindrical tanks |
| Q | Thermal Cracking | 1 Thermal cracking unit with<br>2 Fractionating columns<br>1 Piece U/I equipment<br>1 Pipe furnace<br>1 Compressor building<br>1 Control building<br>6 U/I buildings<br>4 Pieces U/I processing equipment<br>2 Induced-draft cooling towers<br>1 Water basin<br>13 Cylindrical tanks |
| R | Thermal Cracking | 1 Thermal cracking unit with<br>2 Fractionating columns<br>3 Pipe furnaces<br>1 Bank of heat exchangers/ cooling coils<br>1 Control building<br>3 Miscellaneous buildings<br>19 Cylindrical tanks |
| S | Former Crude Oil Distillation | 6 Unidentified buildings<br>2 Cylindrical tanks<br>5 Horizontal tanks<br>Area formerly contained<br>1 Shell still<br>2 Pipe furnaces<br>3 U/I buildings<br>2 Additional cylindrical tanks |

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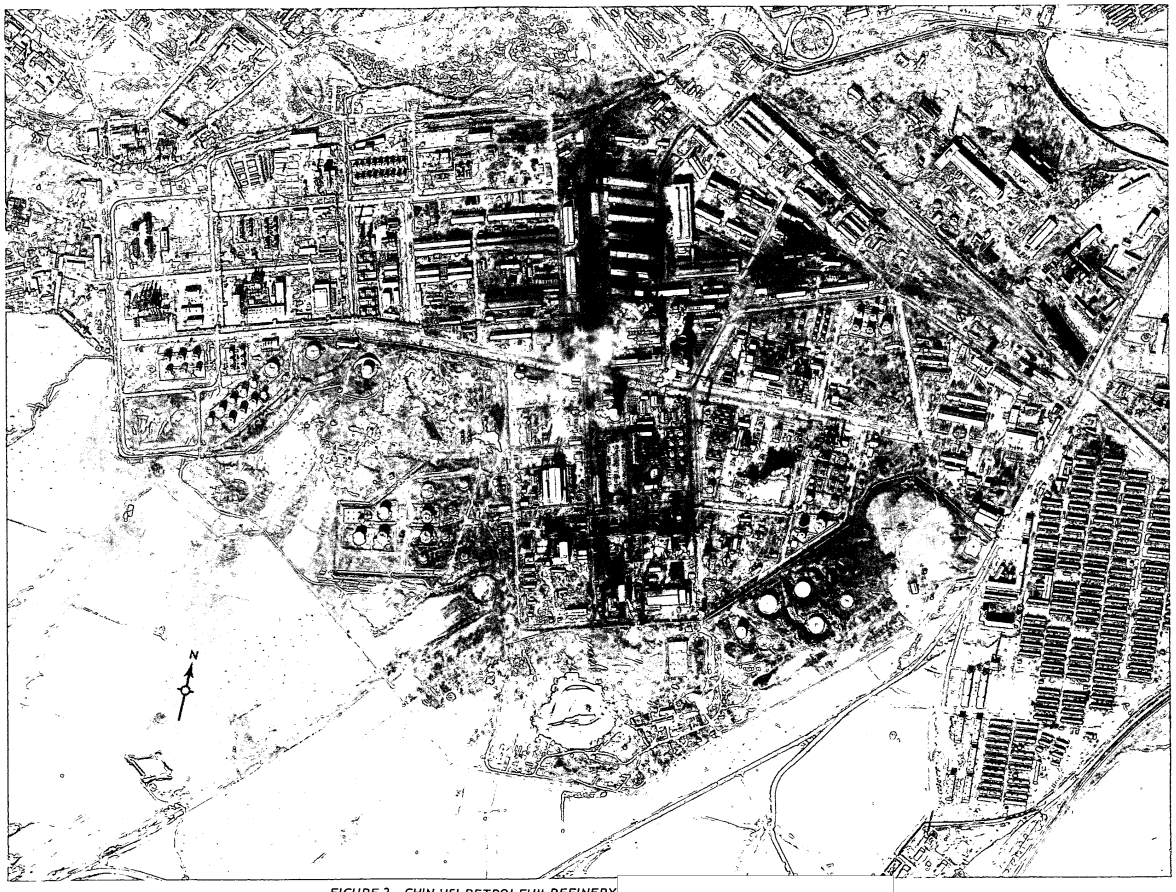


FIGURE 2. CHIN-HSI PETROLEUM REFINERY

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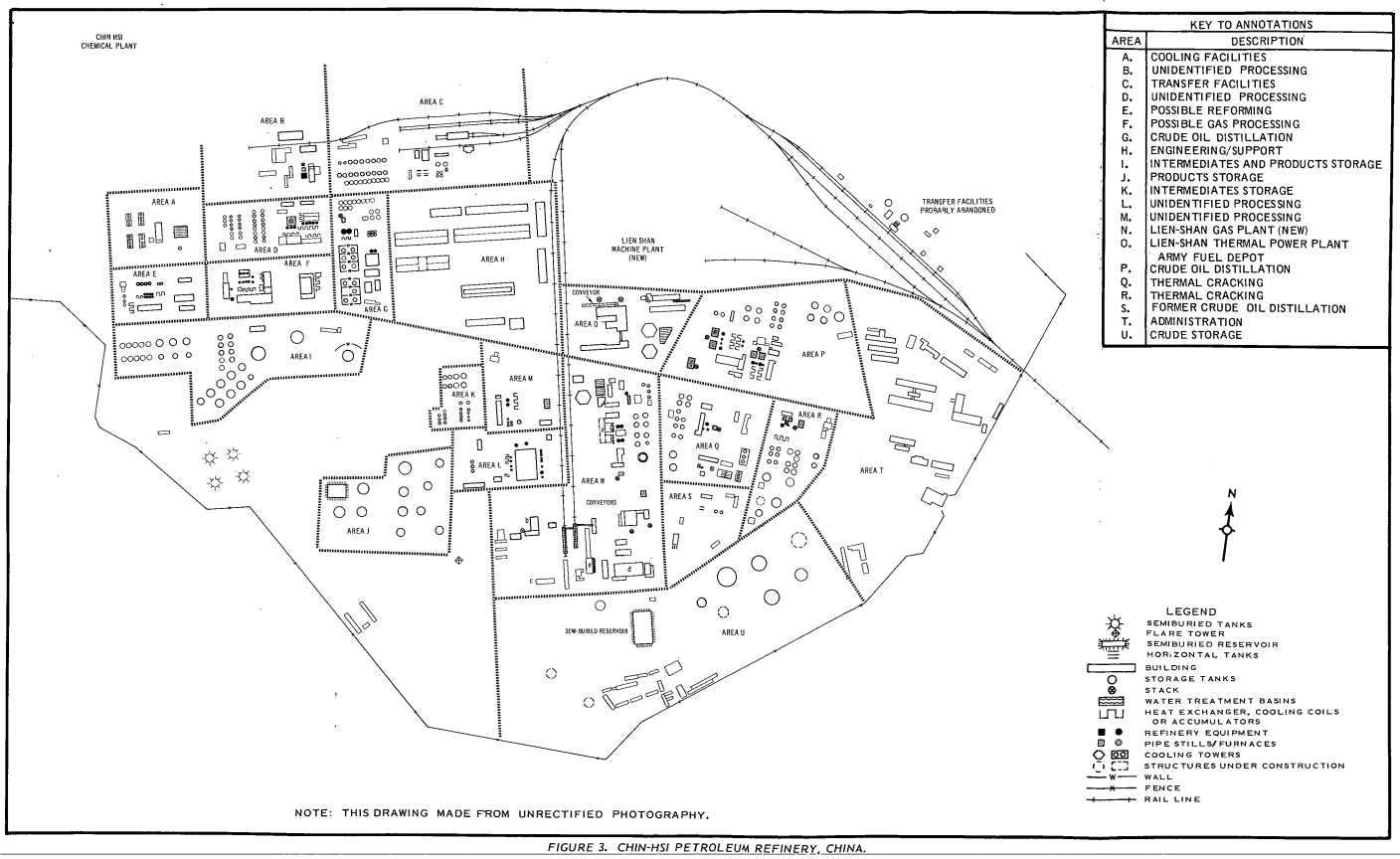


*FIGURE 3. CHIN-HSI PETROLEUM REFINERY, CHINA.*



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| Area | Description | Equipment* |
|---|---|---|
| T | Administration | 2 Administrative buildings<br>1 Motor pool building<br>1 Theater building<br>4 Barrack type buildings<br>1 Firehouse<br>Numerous small support buildings |
| U | Crude Storage | 6 Cylindrical tanks<br>25X1<br>1 Semiburied reservoir 265 by 130 feet<br>2 Large tank excavations<br>2 Tanks in a state of disrepair |

*NOTE: All tank dimensions are approximate.

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REFERENCES

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Map

15th RTS. US Air Target Chart 200, Sheet M0289-24HL, 3rd edition, Sep 66, Scale 1:200,000 (SECRET 25X1

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Documents

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2. CIA. CRS Installation No. 9063468, Chin-hsi Petroleum Refinery, Lien-shan, China (SECRET)

3. DOD. IIR, ChiCom POL Industry Development, Report May 1968 (CONFIDENTIAL) 25X1

Requirement

EXSUBCOM - BR-N/002-69

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