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# memorandum

TO: A. P. Torres, WX-3, C930

DATE: August 7, 1985

FROM: J. F. Baytos

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SYMBOL: M-1

SUBJECT: ANALYSES OF SOIL SAMPLES FOR RESIDUAL EXPLOSIVES FROM DRAINAGE DITCHES AT SUMP EFFLUENT OUTLETS (for July 18, 1984)

The soil samples taken from drainage ditches at the sump effluent outlets of S-Site operating buildings by the Sump Drain Inspection Committee on July 18, 1984, were analyzed for residual explosives content. In addition, the committee inspected and sampled the outfalls at TA-9 (AE-Site, Group M-1) for the first time. The results are presented in the attached table.

The culverts and ponds back of TA-16-260 still show a consistent amount of explosive. The only other spot showing a high concentration is the outfall at TA-16-478, P-Site, high-speed machining building. All other places sampled show 1% or less of total residual explosives as reported on previous memoranda.

The TA-9 samples showed an explosives content at the outfall of TA-9-48, the machining building. The other probable points for accumulation and sedimentation of explosives showed very little and are reasonably clean.

The sampling was easier this time because we have acquired professional soil sampling equipment from J. M. Clements Associates, Inc., Newton, IA. Their JMC Mud Auger allowed us to twist drill into the soil or mud to a depth of 4 inches to get a core sample, which is more representative of the area. The shovel method of sampling always left us with questions.

The analytical procedure used was that developed previously, except a Beckman UV5270 spectrophotometer was used which duplicated the calibration curves of the earlier series.

In summary, there are no radical changes in the residual explosives when compared to earlier inspections. This large, random sampling of all outlets now can be the reference line for monitoring residual explosives at S-Site, as required by the DOE Explosives Safety Handbook.

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# ANALYSES OF SOIL SAMPLES FOR RESIDUAL EXPLOSIVES FROM SUMP EFFLUENT OUTLET DRAINAGE DITCHES AT S-SITE OPERATING BUILDINGS

| Building and Location of Samples | | Acetone[a] Solubles (Wt%) | $CCl_4$[b] Insolubles (Wt%) | $CCl_4$[c] Solubles (Wt%) | HMX/[d] RDX (Wt%) | TNT[d] (Wt%) | Total Explosive (Wt%) |
|---|---|---|---|---|---|---|---|
| 16-260 | 1 m from outfall | 0.6 | 0.4 | 0.1 | 0.3 | 0.0 | 0.3 |
| 16-260 | 10 m from outfall | 14.9 | 13.0 | 1.6 | 10.4 | 0.9 | 11.3 |
| 16-260 | 15 m (center of pond) | 24.2 | 20.4 | 3.8 | 16.7 | 2.3 | 19.0 |
| 16-265 | 2 m from outfall | 0.4 | 0.1 | 0.3 | 0.0 | 0.0 | 0.0 |
| 16-267 | 2 m from outfall | 0.9 | 0.1 | 0.4 | 0.0 | 0.0 | 0.0 |
| 16-307 | at outfall | 0.5 | 0.3 | 0.2 | 0.3 | 0.1 | 0.4 |
| 16-340 | 0.5 m from outfall | 2.4 | 0.5 | 1.9 | 0.1 | 0.9 | 1.0 |
| 16-342 | 1 m from outfall | 0.6 | 0.2 | 0.3 | 0.2 | 0.0 | 0.2 |
| 16-380 | 1 m from outfall | 0.7 | 0.1 | 0.5 | 0.1 | 0.3 | 0.4 |
| 16-400 | 0.5 m from outfall | 0.2 | 0.1 | 0.2 | 0.0 | 0.0 | 0.0 |
| 16-401 | at vessel, burning ground | 0.9 | 0.4 | 0.3 | 0.4 | 0.0 | 0.4 |
| 16-407 | at vessel, burning ground | 0.9 | 0.5 | 0.1 | 0.5 | 0.0 | 0.5 |
| 16-430 | 0.5 m, middle outfall | 7.8 | 0.1 | 7.6 | 0.0 | 0.5 | 0.5 |
| 16-460 | 0.5 m at outfall | 0.2 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 |
| 16-478 | 1 m below berm, P-Site | 0.7 | 0.1 | 0.5 | 0.1 | 0.0 | 0.1 |
| 16-478 | 3 m below berm, P-Site | 5.4 | 4.6 | 0.7 | 4.6 | 0.1 | 4.7 |
| 9-40 | 6 m N of manhole and weir, AE-121 | 0.8 | 0.1 | 0.5 | 0.0 | 0.3 | 0.3 |
| 9-44 | 100 m E Lagoon, 25 m N mag 44 | 0.4 | 0.1 | 0.3 | 0.0 | 0.0 | 0.0 |
| 9-48 | 0.5 m from outfall | 6.1 | 2.9 | 3.2 | 2.7 | 0.8 | 3.5 |
| 9-48 | 1. m from outfall | 0.4 | 0.1 | 0.3 | 0.1 | 0.0 | 0.1 |
| 16-460 | control, blank soil | 0.2 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 |

[a]The filtrate comes from the acetone Soxlet extract on a dried, crushed, 14-mesh sieved, rolled, and quartered sample. This filtrate includes explosives, decomposition products, plastic, lubrication oils, and other natural acetone soluble materials.

[b]The residue from the carbon tetrachloride wash includes the RDX and HMX fractions and other decomposition products from the acetone extract.

[c]The filtrate from the carbon tetrachloride wash includes the TNT fraction and other soluble products.

[d]These values were determined on the Beckman UV 5270 ultraviolet spectrophotometer.

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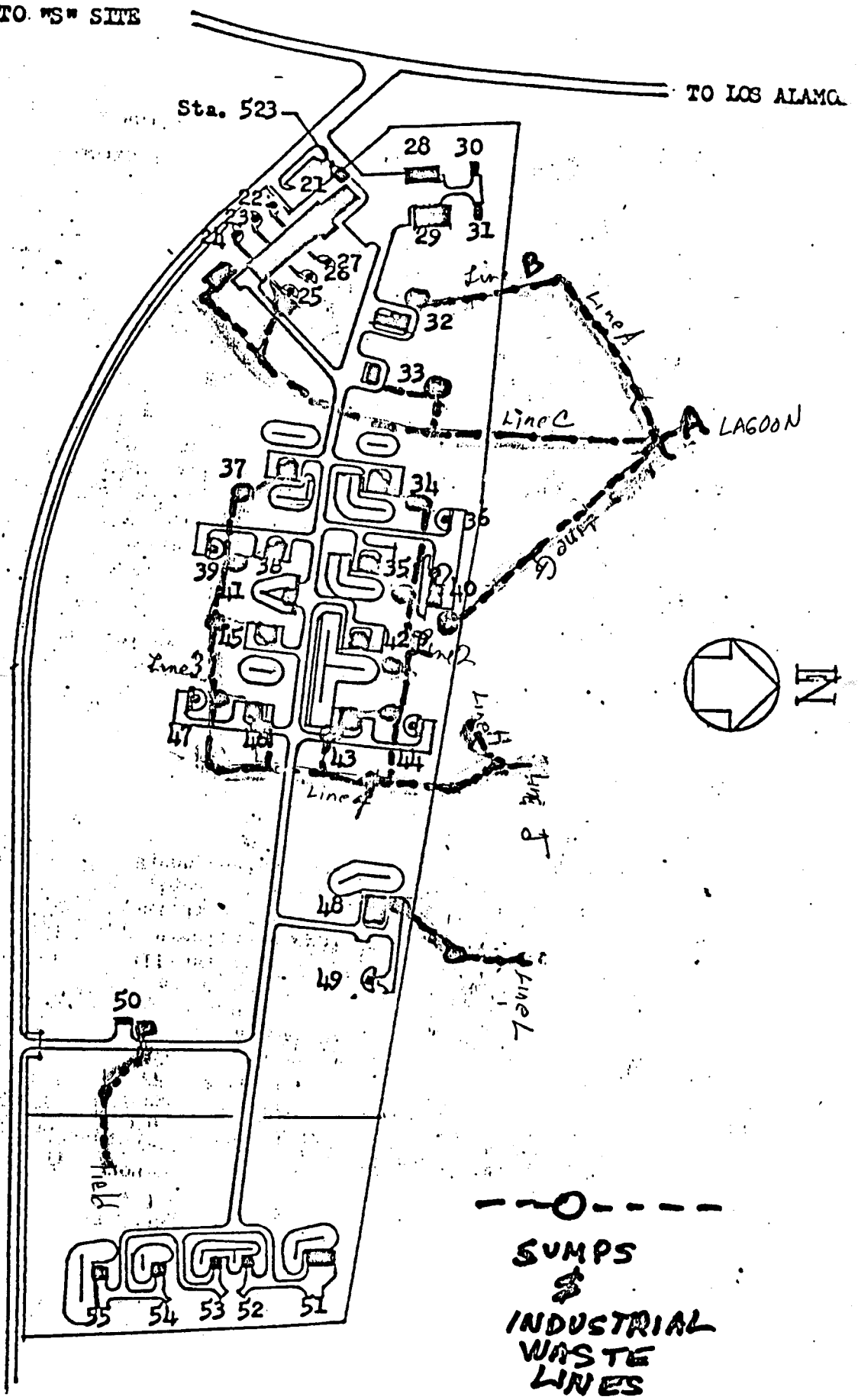
August 7, 1985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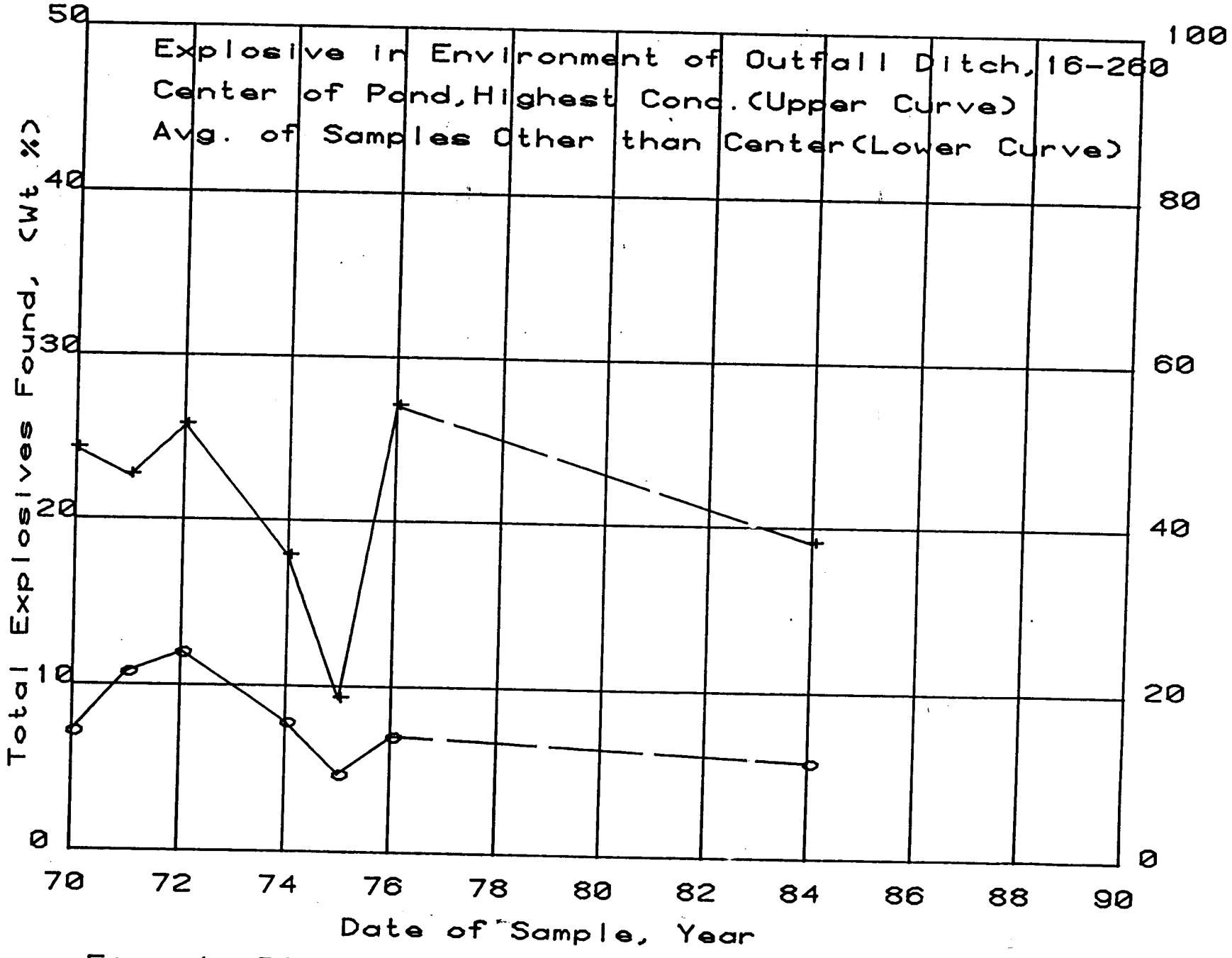
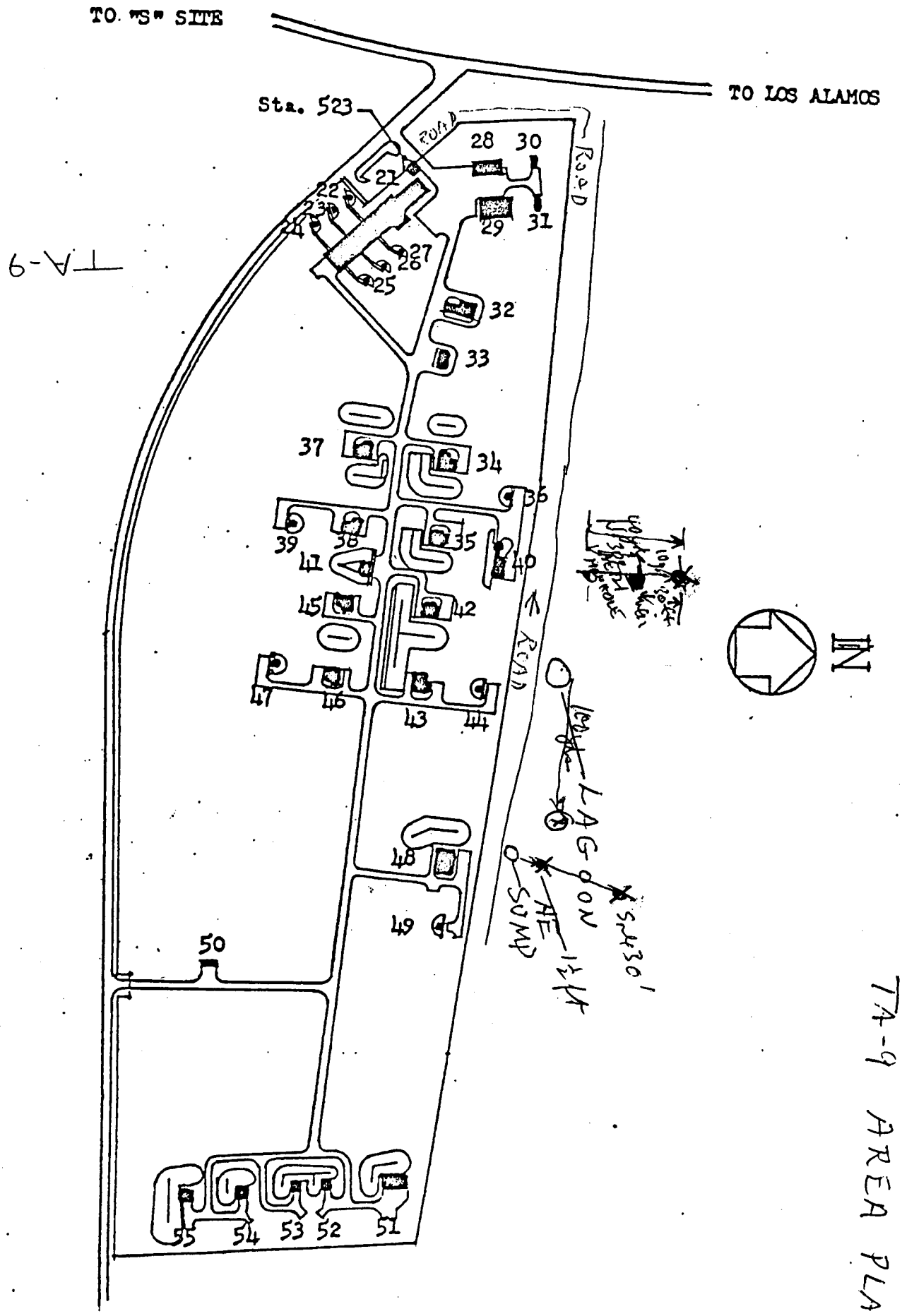



Fig. 1: Plot of Explosives Found vs Year of Inspection




TA-9 AREA PLAN