

**ATK Launch Systems – Promontory  
UTD009081357**

**Draft Post-Closure Permit**

**July 2, 2018**

Draft

**Prepared by:  
The Utah Department of Environmental Quality  
Division of Waste Management and Radiation Control  
Corrective Action Section**

## **ATK LAUNCH SYSTEMS - PROMONTORY** **POST-CLOSURE PERMIT**

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## **MODULE I - STANDARD CONDITIONS**

### **I.A. DEFINITIONS**

- I.A.1. For the purposes of this permit, terms used herein shall have the same meaning as those in R315-260 through R315-273 and R315-101 through R315-102 unless this permit specifically provides otherwise; where terms are not defined in the regulations, or the permit, the meaning associated with such terms shall be defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term.
- I.A.2. “**ACL**” means Alternative Concentration Limit.
- I.A.3. “**Days**” means Calendar Days.
- I.A.4. “**Director**” means the Director of the Division of Waste Management and Radiation Control.
- I.A.5. “**Hazardous Waste Constituent**” means a constituent that caused the Board to list the hazardous waste I R315-261.
- I.A.6. “**Operating Record**” means all monitoring and operational data reports maintained by the Permittee.
- I.A.7. “**LTTA**” is the Permittee’s term for Liquid Thermal Treatment Area. The LTTA consists of the twelve surface impoundments that were closed with waste in place. The twelve units that were used for the disposal of hazardous waste and waste-waters were capped and are located within the M-136 Open Burning Grounds. For the purposes of this Permit, in identifying the area to undergo monitoring and corrective action, the closed units will be referred to as the LTTA and M-136 surface impoundments. These terms may be used synonymously and interchangeably.
- I.A.8. “**Permittee**” means the owner/operator of a facility responsible for implementation of the conditions of this permit.
- I.A.9. “**Photographic Waste Discharge Sites**” is the term that is used to refer to Hazardous Waste Management Units (HWMUs) M-508 and M-636. These HWMUs have been closed, however post-closure requirements apply to these sites due to contaminated groundwater and restrictions on land use at sites M-508 and M-636.
- I.A.10. “**Post-Closure Care Period**” means the period during which the Permittee provides post-closure care for the LTTA surface impoundments and Photographic Waste Discharge Sites. This period has a term of thirty (30) years, as defined in

R315-264-117(a)(1), which commenced on September 21, 1992 for the LTТА surface impoundments and on September 20, 2007 for the Photographic Waste Discharge Sites. The Post-Closure Care Period may be shortened or extended in accordance with R315-264-117(a)(2).

- I.A.11. **“QAPP”** means Quality Assurance Project Plan
- I.A.12. **"R315", or "Utah Administrative Code (UAC) R315"**, means R315 of the Utah Administrative Code.
- I.A.13. **“Release”** means any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of hazardous wastes (including hazardous waste constituents) into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing hazardous wastes or hazardous constituents.)
- I.A.14. **“SAP”** means Sampling and Analysis Plan
- I.A.15. **“Solid Waste Management Unit (SWMU)”** means any discernible area at which solid wastes have been placed at any time, irrespective of whether the area was intended for the management of solid or hazardous waste. Such areas include any part of a facility at which solid wastes have been routinely and systematically released.
- I.A.16. **"Qualified Utah Registered Professional Engineer"** means any individual who is qualified by experience and educated in the appropriate field and is licensed as a Professional Engineer by the Utah Division of Professional Licensing.

**I.B. EFFECT OF PERMIT**

- I.B.1. In accordance with the conditions of this permit, the Permittee shall inspect the M-136 Liquid Thermal Treatment Area (LTТА), monitor groundwater and, as appropriate, extract, and/or treat, hazardous waste constituents and contaminated groundwater resulting from past practices at the Promontory facility. The Permittee shall also maintain site management procedures and control the use of property, as directed by this permit, at the LTТА and Photographic Waste Discharge sites M-508 and M-636.
- I.B.2. Issuance of this permit does not convey property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local laws or regulations. Compliance with the terms of this permit does not constitute a defense to any order issued or any action brought under Section 3013 or Section 7003 of RCRA, Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. § 9606(a)), commonly

known as CERCLA or Superfund), or any other law providing for protection of human health or the environment.

- I.B.3. This permit has been developed in accordance with the applicable requirements of R315-260 through R315-273 and R315-101 through R315-102 of the Utah Hazardous Waste Management Rules. All conditions within this permit shall supercede conflicting statements, requirements, or procedures found within attachments to this permit or R315-260 through R315-273 and R315-101 through R315-102.

**I.C. ENFORCEABILITY**

- I.C.1. Violations documented through the enforcement process pursuant to Utah Code § 19-6-112 may result in penalties assessed in accordance with R315-102.

**I.D. NO WAIVER OF AUTHORITY**

- I.D.1. The Director expressly reserves any right of entry provided by law and any authority to order or perform emergency or other response activities as authorized by law.

**I.E. PERMIT ACTIONS**

- I.E.1. This permit may be modified, revoked, and reissued, or terminated for cause as specified in R315-270-41 and R315-270-43. If the Director determines that cause exists to modify, revoke, and reissue, or terminate this permit, the action will proceed in accordance with R315-124-5.
- I.E.2. The permit may be modified or terminated at the request of the Permittee according to the procedures of R315-270-42. All modification requests involving design drawings, calculations, sketches, etc., shall be reviewed and stamped by a qualified Utah registered professional engineer. All relevant drawings, calculations, sketches, etc., shall be included with the modification request. The permit may also be modified through petition for an ACL in accordance with R315-101. The filing of a request for a permit modification, revocation, reissuance, termination, or the notification of planned changes or anticipated noncompliance on the part of the Permittee does not stay the applicability or enforceability of any permit condition.
- I.E.3. The Director may modify this permit when the standards or rules on which this permit was based have been changed by statute, regulations, publication of new standards or by judicial decision after the effective date of the permit.

**I.F. SEVERABILITY**

- I.F.1. The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby. Invalidation of any state or federal statutory or regulatory provision which forms the basis for any condition of this permit does not affect the validity of any other state or federal statutory or regulatory basis for said condition.

**I.G. DUTIES AND REQUIREMENTS**

- I.G.1. **Duty to Comply:** The Permittee shall comply with all conditions of this permit, except to the extent and for the duration such noncompliance is authorized by an emergency permit, issued in accordance with R315-270-61. Any permit noncompliance, other than noncompliance authorized by an emergency permit, constitutes a violation of the Utah Administrative Rules and may be grounds for enforcement action, permit termination, revocation and reissuance, or modification of the permit.
- I.G.2. **Duty to Reapply:** At least 180 days before the expiration of this permit, the Permittee shall submit a complete application pursuant to R315-270-14 and applicable requirements of R315-270-10 through 29.
- I.G.3. **Review of Permit:** In accordance with the Utah Solid and Hazardous Waste Act, UCA § 19-6-108(13), this permit shall be reviewed at five-year intervals after the effective date and modified, if necessary.
- I.G.4. **Permit Expiration:** The permit shall expire ten years from the date of issuance. This permit and all conditions herein will remain in effect beyond the permit's expiration date until such time as the Director has issued a new permit, pursuant to R315-264-117(a), or the Director has terminated this Permit.
- I.G.5. **Post-Closure Care Period Expiration:** Ninety-days prior to the expiration of the thirty (30) year post closure periods specified in Condition I.A.10, the Permittee shall submit to the Director for approval a Class 2 Modification to this Permit to extend the Post-Closure Care Period and associated financial assurance or a justification to not extend the Post-Closure Care Period. Until the Director modifies this Permit to extend the post closure period and financial assurance, the Permittee shall comply with the existing financial assurance for post-closure care requirements in accordance with Condition II.G.
- I.G.6. **Need to Halt or Reduce Activity Not a Defense:** It shall not be a defense for the Permittee, in any enforcement action that it would have been necessary, to halt or

reduce the permitted activity in order to maintain compliance with the conditions of this permit.

- I.G.7. **Duty to Mitigate:** In the event of noncompliance with the permit, the Permittee shall take all reasonable steps to minimize releases of hazardous waste constituents to the environment and shall carry out such measures as are reasonable to prevent significant adverse impacts on human health or the environment.
- I.G.8. **Proper Operation and Maintenance:** The Permittee shall at all times properly operate and maintain all facilities and systems of treatment, control and monitoring (and related apparatus) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.
- I.G.9. **Duty to Provide Information:** The Permittee shall furnish to the Director, within the time specified within the Director's request any relevant information to determine whether cause exists for modifying, revoking or reissuing this permit, or to determine compliance with this permit. The Permittee shall also furnish to the Director upon request, copies of records required to be kept by this permit.
- I.G.10. **Inspection and Entry:** Pursuant to Utah Code § 19-6-109, the Permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law to;
- I.G.10.a. Enter at reasonable times upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
- I.G.10.b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- I.G.10.c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit;
- I.G.10.d. Sample or monitor, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Utah Solid and Hazardous Waste Act, any substances or parameters at any location; and

- I.G.10.e. Make a record of inspections by photographic, electronic, video tape, or any other reasonable medium. No audio recording devices shall be used without notice to all individuals in recording range prior to activation of the recording device. Photographic and video recording shall comply with the safety and security requirements of the Permittee.
- I.G.11. **Reporting Planned Changes:** The Permittee shall give notice to the Director sixty (60) days prior to any planned physical alteration to the closed facility or permitted activity.
- I.G.12. **Anticipated Noncompliance:** The Permittee shall give thirty (30) days advance notice to the Director of any planned changes in the closed facility or permitted activity which may result in noncompliance with permit requirements. Advance notice shall not excuse any noncompliance.
- I.G.13. **Transfer of Permit:** This permit may be transferred to a new Permittee, only if it is modified or revoked and reissued under R315-270-40 to identify the new Permittee and incorporate such other requirements as may be necessary under the appropriate Act.
- I.G.14. **Monitoring and Records:** Samples and measurements taken for the purpose of monitoring shall be accurate and representative of the monitored activity. The method used to obtain representative samples shall be an appropriate method as specified in the SAP and QAPP included in Attachment 3. Laboratory methods must be those specified in "Test Methods for Evaluating Solid Waste; Physical/Chemical Methods SW-846 (Third Edition, Revision 6, February 2007)" or the most currently promulgated edition, "Standard Methods for Examination of Water and Wastewater (17th Edition or most current editions)."; An equivalent method may be allowed if approved in writing by the Director and incorporated in the SAP and QAPP included in Attachment 3. The analysis of all samples shall be conducted by Utah State certified laboratories.
- I.G.15. The Permittee shall follow the Quality Assurance/Quality Control procedures for sample collection and analysis as described in the Quality Assurance Project Plan and Sampling and Analysis Plan contained in Attachment 3 of this Permit.
- I.G.16. Any request for a substitution of an analytical method which is equivalent to the method specifically approved for use in this permit shall be submitted to the Director for review and approval in accordance with R315-260-21. The request shall provide information demonstrating that the proposed method requested to be substituted is equivalent or superior in terms of sensitivity, accuracy, and precision (i.e. reproducibility).
- I.G.17. The Permittee shall retain as part of the Operating Record at the Promontory facility, all records or reports generated as a result of this permit for the duration



of the post-closure period. This period may be extended by request of the Director at any time and is automatically extended during the course of any unresolved enforcement action regarding this facility.

I.G.18. **Reporting Requirements:** The Permittee shall report to the Director any non-compliance with the permit. Reporting shall not constitute a defense for any noncompliance. Reporting shall include, at a minimum, the following:

I.G.18.a. Information concerning the non-compliance which may endanger public drinking water supplies; human health or the environment. Such information shall be reported orally as soon as possible and no later than twenty-four (24) hours from the time the Permittee becomes aware of the circumstances. The description of the occurrence and its cause shall include:

I.G.18.a.i. Name, address, and telephone number of the Permittee;

I.G.18.a.ii. Name, address, and telephone number of the individual making the report;

I.G.18.a.iii. Date, time and type of incident;

I.G.18.a.iv. Description and quantity of materials involved;

I.G.18.a.v. The extent of injuries, if any;

I.G.18.a.vi. An assessment of actual or potential hazard to the environment and health outside the facility, where this is applicable; and

I.G.18.a.vii. Estimated quantity and disposition of recovered material that resulted from the incident.

I.G.18.b. A written submission shall also be provided within seven days of the time the Permittee becomes aware of the circumstances. The written submission shall contain, at a minimum; a description of the non-compliance and its cause; the periods of non-compliance (including exact dates and times); whether the non-compliance has been corrected; and if not, the anticipated time it is expected to continue and steps taken or planned to reduce, eliminate, and prevent recurrence of the non-compliance. The Permittee need not comply with the seven day written notice requirement if the Director waives the requirement and the Permittee submits a written report within fifteen (15) days of the time the Permittee becomes aware of the circumstances.

I.G.18.c. If the non-compliance does not endanger human health or the environment, a written submission shall be provided to the Director within twenty-one (21) days of the time the Permittee becomes aware of the circumstances. The description of the occurrence shall include, but not be limited to, all items as listed in Conditions

I.G.18.a.i. through I.G.18.a.vii. The written submission shall contain, at a minimum; a description of the non-compliance and its cause; the periods of non-compliance (including exact dates and times); whether the non-compliance has been corrected; and if not, the anticipated time it is expected to continue and steps taken or planned to reduce, eliminate, and prevent recurrence of the non-compliance.

I.G.19. **Monitoring Reports:** Monitoring reports shall be submitted to the Director at the intervals specified elsewhere in this permit.

I.G.20. The Permittee shall submit additional copies of each plan, report, notification, or other submissions required by this permit, as requested by the Director.

I.G.21. **Compliance Schedules:** Reports of compliance or non-compliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted to the Director no later than fourteen (14) days following each scheduled event.

I.G.22. **Other Information:** Whenever the Permittee becomes aware that he failed to submit any relevant facts in the permit application or submitted incorrect information in a permit application or in any report to the Director, the Permittee shall submit such facts or corrected information to the Director within seven days of discovery.

#### **I.H. CERTIFICATION OF CONSTRUCTION OR MODIFICATION**

I.H.1. The Permittee may not commence storage, treatment, or disposal of hazardous waste in any newly permitted unit or in a modified portion of an existing, permitted unit, as provided for in R315-270-42, until the Permittee has submitted by certified mail, express mail, or hand delivery to the Director:

I.H.1.a. A letter signed by the Permittee and an independent, Utah registered, professional engineer qualified by experience and education in an appropriate engineering field, certifying that the permitted unit at Promontory has been constructed or modified in accordance with the approved modification request and this Permit;

I.H.1.b. As built engineering plans and specifications; and

I.H.1.c. The Director, or designated representative, has reviewed and inspected the modified or newly constructed unit and has notified the Permittee in writing that the unit was found to be in compliance with the conditions of this Permit and the modification request; or

I.H.1.d. If, within fifteen (15) days of the date of submission of the letter required by Condition I.H.1., the Permittee has not received notice from the Director of the

intent to inspect, prior inspection is waived and the Permittee may commence treatment, storage, or disposal of hazardous waste in the permitted unit if certified in accordance with Condition I.H.1.

**I.I. SIGNATORY REQUIREMENT**

- I.I.1. All applications, reports or other information requested by or submitted to the Director shall be signed and certified as required by R315-270-11.

**I.J. CONFIDENTIAL INFORMATION**

- I.J.1. The Permittee may make a claim for confidentiality of any information required to be submitted by this permit in accordance with Utah Code §§ 19-1-306, 63G-2-309 and R315-270-12.

**I.K. DOCUMENTS TO BE MAINTAINED AT FACILITY SITE**

- I.K.1. The Permittee shall maintain at the Promontory facility, for the duration of the post-closure care period, the following documents and amendments, revisions and modifications to these documents:
- I.K.1.a. The post-closure permit application;
- I.K.1.b. Post-closure monitoring records, to include groundwater monitoring records and analytical results, groundwater treatment system unit records and analytical results, and records of the effectiveness of the groundwater treatment system, as required by this permit;
- I.K.1.c. Certification of closure as required by R315-264-115;
- I.K.1.d. Personnel training documents and records as required by R315-264-16(d) and this permit;
- I.K.1.e. Inspection schedules as required by R315-264-15(b) and this permit;
- I.K.1.f. The Operating Record required by R315-264-73 and this permit; and
- I.K.1.g. Copies of all required submittals as listed in Tables I-1 and I-2 of this Module.

**I.L. PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT**

- I.L.1. Pursuant to Section 3005(c)(3) of RCRA (Section 212 of HSWA) and R315-270-32(b)(2), this permit contains those terms and conditions determined necessary to protect human health and the environment.

**I.M. REQUIRED SUBMISSIONS UNDER THIS PERMIT**

I.M.1. The Permittee shall submit the following documents to the Director as specified by permit conditions:

**TABLE I - 1**

<b>REQUIRED SUBMISSION</b>	<b>PERMIT CONDITION</b>	<b>DATE OR EVENT</b>
1. Application for permit reissuance	I.G.2.	180 days before expiration of permit
2. Financial Assurance Certification	II.G.	In accordance with Conditions II.G.
3. Annual adjustment of post-closure cost estimate	III.D.2.	In accordance with Condition III.D.2.
4. Post-closure cost estimate	III.D.5.	30 days after modification of permit as appropriate
5. Annual Groundwater Monitoring Plan	IV.B.2.a.	30 days prior to collection of samples
6. Total monitoring well depth data	IV.D.1.c.	In accordance with Condition IV.E.2.
7. Monitoring Well Completion Reports	IV.D.2.c.	90 days after well completion
8. Annual Groundwater Monitoring Reports	IV.E.2.	In accordance with Condition IV.E.2. and Table IV-2
9. Semiannual Spring Sampling Results	IV.B.2.b.	In accordance with Conditions IV.B.2.b. and IV.E.2.c.
10. Groundwater Flow and Contaminant Transport Model	V.E.2.	In accordance with Condition IV.E.2.j.
11. Human Health Risk Assessment for Groundwater	V.A.2.	In accordance with Condition V.A.2.
12. Ecological Risk Assessment for Groundwater	V.A.3.	One year after approval of the Groundwater Model
13. Corrective Measures Study for Groundwater Corrective Action	V.B.1.	90 days after approval of the Risk Assessments
14. Corrective Measure Implementation Plan for Groundwater	V.C.1.	90 days after approval of the Corrective Measures Study
15. Corrective Measure Implementation Report for Groundwater	V.D.1.	90 days after completing construction of corrective measure(s)
16. Annual calibration of Groundwater Flow and Contaminant Transport Model	V.E.2.	In accordance with Condition IV.E.2.j.
17. Summary on the Effectiveness of the Corrective Action Program for Groundwater	V.E.3.	In accordance with Condition IV.E.2.

**TABLE I-1 (Continued)**

<b>REQUIRED SUBMISSION</b>	<b>PERMIT CONDITION</b>	<b>DATE OR EVENT</b>
18. Corrective Measure Completion Report	V.F.1.	Upon attaining the Corrective Measure Completion Criteria
19. Schedule for submitting RFI Workplans	VI.C.3.	By January 15 <sup>th</sup> of each year
20. RFI Work Plans	VI.C.1.	In accordance with the approved schedule (VI.C.3.)
21. RFI Report	VI.E.1.	In accordance with RFI Workplan approved schedule (VI.D.2.i.)
22. Phase II RFI Work Plan for additional investigations (as applicable)	VI.F.1.	In accordance with RFI Report approved schedule (VI.E.1.i.)
23. Corrective Measures Study for SWMUs (as applicable)	VI.G.3.	In accordance with VI.G.
24. Corrective Action Plan for SWMUs	VI.G.1.	In accordance with RFI Report approved schedule (VI.E.1.i.)
25. Corrective Action Report for SWMUs	VI.G.6.	In accordance with Corrective Action Plan approved schedule (VI.G.4.k.)
26. Human Health and Ecological Risk Assessment (as applicable)	VI.H.2.	In accordance with Section VI.H.
27. Site Management Plan (as applicable)	VI.I.2.	In accordance with VI.I.2.
28. Interim Measure Plan (as applicable)	VI.J.2.	In accordance with VI.J.2.
29. Semiannual RFI Progress Reports	VI.L.	In accordance with VI.L.2.

I.M.2. All reports, modifications, notifications, or other submittals that are required to be provided to the Director under these permit provisions shall be sent by certified mail or other means with proof of delivery to:

Director, Division of Waste Management and Radiation Control  
Department of Environmental Quality  
P.O. Box 144880  
Salt Lake City, UT 84114-4880  
Phone (801) 536-0200

I.M.3. All hand-delivered submissions shall be made during normal business hours, at the Multi Agency State Office Building 195 North 1950 West, Second Floor, Salt Lake City, Utah.

**I.N. REQUIRED NOTIFICATIONS UNDER THIS PERMIT**

I.N.1. The Permittee shall make the following notifications to the Director as specified by permit conditions:

**TABLE I - 2**

<b>REQUIRED NOTIFICATION</b>	<b>PERMIT CONDITION</b>	<b>DATE OR EVENT</b>
1. Planned alteration to the closed LTTAs or permit activity	I.G.10.	60 days before planned alteration
2. Anticipated non-compliance	I.G.11.	30 days before planned change
3. Non-compliance with the permit	I.G.17.a.	24 hours after discovery (oral)
4. Non-compliance with the permit	I.G.17.b.	7 days after discovery
5. Non-compliance with the permit	I.G.17.c.	21 days after discovery
6. Compliance schedule requirements	I.G.20.	14 days after scheduled event
7. Missing or incorrect information	I.G.21.	7 days after discovery
8. Certification of construction or modification	I.H.1.	In accordance with Condition I.H.1.
9. Reporting releases of hazardous constituents	II.E.2.	In accordance with Condition II.E.2.
10. Incapacity of financial assurance requirement	II.I.1.	In accordance with Condition II.I.1.
11. Improperly operating groundwater monitoring well	IV.D.1.b.	7 days after discovery
12. Improperly operating groundwater treatment system	V.E.5.	7 days after discovery
13. RFI Field Work/Sampling	VI.B.4.	7 days prior to conducting field work
14. Release of hazardous constituents from a SWMU	VI.J.	Upon discovery
15. Newly identified SWMUs	VI.K.1.	30 days after discovery of SWMU

## **MODULE II - GENERAL FACILITY STANDARDS**

### **II.A. POST-CLOSURE MAINTENANCE AND MONITORING**

- II.A.1. The Permittee shall inspect and monitor the closed LTTAs throughout the post-closure care period, in a manner that will ensure detection of a release of hazardous waste, hazardous waste constituents, leachate, contaminated runoff or hazardous waste decomposition products to the soil, groundwater, or surface water from the closed facility. The Permittee shall maintain all treatment, containment and monitoring equipment through the post-closure care period in a manner that will ensure detection of a release from the closed facility and minimize the possibility of fire, explosion, or any sudden or non-sudden release of hazardous waste constituents to air, soil, surface water, or groundwater which could threaten human health or the environment.

### **II.B. SECURITY**

- II.B.1. The Permittee shall comply with the following security conditions:
- II.B.1.a. A fence with locked gates surrounding the closed LTTAs on all sides, which prevents unauthorized entry, shall be maintained throughout the post-closure care period; and
- II.B.1.b. Signs which read "DANGER, UNAUTHORIZED PERSONNEL KEEP OUT" shall be posted at the entrance gates to the LTTA and every 100 feet along the fence surrounding the LTTA and shall be maintained throughout the post-closure care period. The signs must be legible from a distance of at least 25 feet in compliance with R315-264-14(c).
- II.B.1.c. Signs which read "HAZARDOUS WASTE MANAGEMENT UNIT – RESTRICTIONS ON LAND USE APPLY" shall be posted at entrances and every 100 feet around the designated area of HWMUs M-508 and M-636.
- II.B.2. All security equipment shall be inspected throughout the post-closure care period in accordance with the Inspection Schedules and Procedures, Attachment 2. The Permittee shall incorporate those security items (i.e. fence, signs of vandalism, etc.) to be inspected and the frequency of inspection on the inspection checklist.
- II.B.3. Damaged security equipment shall be noted in the inspection checklist and repairs shall begin within twenty-four (24) hours. Repairs shall be completed as soon as practicable, but not later than seventy-two (72) hours after the problem is discovered, in compliance with R315-264-15(c).

- II.B.4. The Permittee shall comply with all other security procedures as specified in Attachment 1.

**II.C. PERSONNEL TRAINING**

- II.C.1. The Permittee shall conduct personnel training as required by R315-264-16.
- II.C.2. The Permittee shall maintain training documents and records as required by R315-264-16(d) and (e), and shall record the type and amount of training received by each employee involved in hazardous waste management.
- II.C.3. New personnel shall complete the required personnel training within six months of their hire date. Training records shall indicate the type and amount of training received.

**II.D. GENERAL INSPECTION REQUIREMENTS**

- II.D.1. The Permittee shall follow the inspection schedules as specified in Attachment 2.
- II.D.2. Repairs or maintenance for any deterioration or malfunction discovered by an inspection shall be initiated by the Permittee within seventy-two (72) hours except for damaged security equipment. As stated in Permit Condition II.B.3., repairs to damaged security equipment shall begin within twenty-four (24) hours. Repairs to security equipment shall be completed as soon as practicable, but not later than seventy-two (72) hours after the problem is discovered.
- II.D.3. Any problem which could endanger human health or the environment shall be corrected as soon as possible. Corrective action shall start no later than the next working day from the time the problem is discovered.
- II.D.4. The Permittee shall inspect the closed portions of the facility within twenty-four (24) hours after a storm event. A storm event shall be defined as precipitation in excess of 1.00 inch in a one hour period as measured by the equipment required in II.D.4.a. It shall be documented in the inspection log that the inspection was conducted in response to a storm event.
- II.D.4.a. The Permittee shall install, on its premises, equipment appropriate to measure and record precipitation in order to determine the occurrence of storm events.
- II.D.5. The Permittee shall inspect on an annual basis all monitoring wells, extraction wells, and injection wells that are part of the groundwater monitoring system as specified below and in Section II.E., Attachment 2:
- II.D.5.a. Inspect for damage to the above ground casing;



- II.D.5.b. Inspect for damage to cement apron and assure that the annulus is properly sealed;
- II.D.5.c. If permanent, dedicated, pumps are used, verify proper operation;
- II.D.5.d. Check for visible damage and tampering to locks and monitoring well caps; and
- II.D.5.e. Insure that the wells are accessible and visible.

II.D.6. Records of inspections shall be kept at the Promontory facility, Box Elder County, Utah as indicated by condition I.G.16., throughout the post-closure care period. The Groundwater Monitoring System Annual Inspection Checklist (as shown in Attachment 2) shall be submitted with the Annual Groundwater Monitoring Report (See Condition IV.E.2.)

## **II.E. CONTINGENCY PLAN**

II.E.1. **Content of Plan.** The Permittee shall maintain a Contingency Plan, Attachment 4 of this permit, for the duration of the permit, which meets the requirements of R315-264-52.

II.E.2. **Implementation of Plan.** When dictated by the Contingency Plan, Attachment 4, of the Hazardous Waste Storage Permit, the Permittee shall immediately carry out the provisions of the plan, and follow the emergency procedures described by R315-264-56. Whenever there is a fire, explosion, or release of a reportable quantity of hazardous waste or hazardous waste constituents, the Permittee shall comply with R315-263-30 in reporting releases to the Director.

II.E.3. **Copies of Plan.** The Permittee shall comply with the requirements of R315-264-53.

II.E.4. **Amendments to Plan.** The Permittee shall review and immediately amend, if necessary, the Contingency Plan, Attachment 4, as required by R315-264-54.

## **II.F. RECORD KEEPING AND REPORTING**

II.F.1. The Permittee shall submit reports as required to the Director documenting post-closure monitoring activities and results from analyses of samples collected in compliance with closure and post-closure monitoring requirements. Copies of all Permit-related records shall be maintained, as specified in Condition I.G.16.

**II.G. FINANCIAL ASSURANCE FOR POST-CLOSURE CARE**

- II.G.1. The Permittee shall demonstrate continuous compliance with the financial assurance requirements by providing a third party financial assurance certification of at least the amount of the post-closure cost estimate established in Condition III.D. The Permittee may substitute other instruments of financial assurance provided the method, funding and wording requirements of R315-264-143 are followed and approved in writing by the Director.
- II.G.2. The financial assurance document shall be updated, including adjusting the post-closure cost estimate for inflation, within sixty (60) days of the anniversary date of the establishment of the financial assurance instrument or within sixty (60) days of the Director's approval of a revised post-closure cost estimate in accordance with R315-264-143. Changes in financial assurance mechanisms must be approved in writing by the Director at least sixty (60) days prior to such a change.

**II.H. LIABILITY REQUIREMENTS**

- II.H.1. The Permittee shall demonstrate continuous compliance with the requirements of R315-264-147(b) to have and maintain liability coverage for non-sudden accidental occurrences.
- II.H.2. Changes in liability coverage mechanisms shall be approved in writing by the Director at least sixty (60) days prior to such a change.

**II.I. INCAPACITY OF PERMITTEE, GUARANTORS OR FINANCIAL INSTITUTIONS**

- II.I.1. The Permittee shall comply with the notification and financial requirements of R315-264-148.

**MODULE III - USE OF PROPERTY AND POST-CLOSURE CARE FOR THE LTTAs  
AND PHOTOGRAPHIC WASTE DISCHARGE SITES**

**III.A. USE OF PROPERTY**

- III.A.1. The Permittee has closed and capped the M-136 LTTAs with waste in place. The M-508 and M-636 Photographic Waste Discharge Sites have both been closed with residual contamination remaining that exceeds standards for residential use.
- III.A.2. The Permittee and the Director entered into Environmental Covenants for the M-136 LTTAs and the M-508 and M-636 Photographic Waste Discharge sites. The Environmental Covenants establish the sites' locations, specify the land use restrictions, and identify the contaminants that remain at each site.
- III.A.3. The Environmental Covenants run with the land and a Notice upon Conveyance is required that informs any new owner of the land use restrictions that apply to the sites. The Environmental Covenants were recorded with the Box Elder County Recorder and are included in Attachment 1.

**III.B. POST-CLOSURE CARE**

- III.B.1. The Permittee shall conduct all post-closure care activities in accordance with this permit, and in compliance with R315-264-110 and R315-264-117 for the duration of the post-closure period.
- III.B.2. The Permittee shall maintain and monitor the LTTAs and Photographic Waste Discharge Sites M-508 and M-636, after completion of closure and corrective action activities, in compliance with R315-264-228, R315-264-117 and this permit. The Permittee shall:
- III.B.2.a. Maintain the integrity and effectiveness of the final LTTA covers in compliance with R315-264-228(b)(1) and Attachments 1 and 2 of the permit, including making repairs to the caps as necessary to correct the effects of settling, subsidence, erosion or other events;
- III.B.2.b. Maintain the signs and other security equipment at the Photographic Waste Discharge Sites M-508 and M-636.
- III.B.2.c. Maintain and monitor the groundwater monitoring system and the groundwater treatment and containment system in compliance with R315-264-228(b)(3), R315-264-90 and Modules V and VI of this permit;
- III.B.2.d. Prevent run-on and run-off from eroding or otherwise damaging the final LTTA covers in compliance with R315-264-228(b)(4);

- III.B.2.e. Prohibit post-closure use of the property at M-136, which will disturb the integrity of the final cover, containment systems, or monitoring system; and,
- III.B.2.f. Protect and maintain surveyed benchmarks.

**III.C. INSPECTIONS**

- III.C.1. Inspections of the LTTAs shall be conducted during the post-closure care period in compliance with the procedures specified in Condition II.D and Attachment 2. All records of inspections and remedial actions shall be retained in the Operating Record, as required by condition I.G.16., throughout the post-closure care period. Any deterioration or malfunction discovered by an inspection shall be remedied in accordance with Condition II.D.2.

**III.D. COST ESTIMATES FOR POST-CLOSURE CARE**

- III.D.1. The Permittee's post-closure cost estimate shall be prepared in accordance with R315-264-144.
- III.D.2. The Permittee shall adjust the post-closure cost estimate for inflation as specified by R315-264-144(b) each year and submit a copy of the adjusted cost estimate to the Director for written approval.
- III.D.3. Before each new hazardous waste management unit is placed in operation, an updated closure/post-closure cost estimate including the new unit shall be prepared. This revised cost shall be submitted at least sixty (60) days prior to placing the unit in operation.
- III.D.4. A revised closure/post-closure cost estimate shall be submitted to the Director for written approval within sixty (60) days after an unexpected event that affects the cost estimate.
- III.D.5. The Permittee shall revise the post-closure cost estimate within thirty (30) days after the Director has approved a request to modify this permit and has determined the permit modification impacts the cost estimate.
- III.D.6. The Permittee shall keep at the facility the latest closure cost estimate as required by R315-264-144(d) as part of the facility Operating Record.

**III.E. FINANCIAL ASSURANCE FOR POST-CLOSURE CARE**

- III.E.1. The Permittee shall maintain financial assurance for post-closure care as required by Conditions II.G.1. and II.G.2.

**III.F.        LIABILITY REQUIREMENTS**

- III.F.1.        The Permittee shall comply with the liability requirements as specified in Conditions II.H.1. and II.H.2.

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## **MODULE IV - GROUNDWATER MONITORING**

### **IV.A. POST-CLOSURE GROUNDWATER MONITORING**

- IV.A.1. Hazardous constituents have been released from the M-136 LTTAs, the M-508 Photographic Waste Discharge Site and other waste management sites at the facility. The Permittee shall monitor groundwater in the impacted aquifers as described in this Module and Attachment 3. The Permittee shall maintain compliance with R315-264-90 Groundwater Protection during the post-closure care period as defined in Condition IV.A.6.
- IV.A.2. The Permittee shall maintain a groundwater monitoring system. The monitoring well system consists of all wells dedicated to monitoring the release of hazardous constituents from M-136, M-508 and other waste management sites at the facility. The monitoring well system shall consist of the wells, piezometers and springs specified in Table 4-A of Attachment 4. The monitoring well, piezometer and spring locations are also presented in Attachment 4, Plates 1A and 1B.
- IV.A.3. The Area of Compliance is defined as all monitoring wells, piezometers and springs located within impacted aquifers and displaying concentrations that exceed the Groundwater Protection Standard as defined in section IV.C. of this Permit module.
- IV.A.4. The Permittee shall implement the corrective action program, as described in Module V, upon exceedance of the Groundwater Protection Standard within the Area of Compliance.
- IV.A.5. Solid waste management units (SWMUs) may be subject to certain provisions of this Module. The Director shall determine which SWMUs may be subject to some or all of the provisions of this Module.
- IV.A.6. The Permittee shall monitor the groundwater throughout the post-closure care period. If any of the Groundwater Protection Standards, or approved Alternate Concentration Limits, are still exceeded after thirty (30) years, the Permittee shall continue corrective action as specified in Condition V.F.
- IV.A.7. The Permittee shall maintain a searchable data base so that a complete record of the chemical and well specific groundwater monitoring data, collected in accordance with this Module, is available.

### **IV.B. REQUIRED PROGRAM**

- IV.B.1. The Permittee shall monitor groundwater, in accordance with Section IV.B., for the hazardous constituents listed below in Table IV-1.

- IV.B.1.a. The groundwater quality assessment, completed by the Permittee, determined the hazardous constituents listed in Table IV-1 below were released at the site, entered the impacted aquifer, and have been detected beyond the compliance point. Some constituents have been detected beyond the facility boundary. The Permittee shall monitor the groundwater for the constituents listed in Table IV-1 as specified in the Sampling and Analysis Plan, Attachment 3.

**TABLE IV-1**

**CONSTITUENTS AND GROUNDWATER PROTECTION STANDARD**

Constituent	GWPS (ug/L)	Constituent	GWPS (ug/L)
1,1-Dichloroethene	7.0 <sup>1</sup>	Trans-1,2-dichloroethene	100 <sup>1</sup>
1,1-Dichloroethane	2.8 <sup>2</sup>	Trichloroethene	5.0 <sup>1</sup>
1,2-Dichloroethane	5.0 <sup>1</sup>	Trichlorofluoromethane	5,200 <sup>2</sup>
1,1,1-Trichloroethane	200 <sup>1</sup>	Vinyl Chloride	2.0 <sup>1</sup>
1,1,2-Trichloroethane	5.0 <sup>1</sup>	Xylene	10,000 <sup>1</sup>
Acetone	14,000 <sup>2</sup>	Arsenic	10 <sup>1</sup>
Benzene	5.0 <sup>1</sup>	Barium	2,000 <sup>1</sup>
Carbon Tetrachloride	5.0 <sup>1</sup>	Beryllium	4.0 <sup>1</sup>
Chlorobenzene	100 <sup>1</sup>	Chromium (total)	100 <sup>1</sup>
Chloroform	80 <sup>2,3</sup>	Chromium VI	0.035 <sup>2</sup>
Cis-1,2-Dichloroethene	70 <sup>1</sup>	Cobalt	6 <sup>2</sup>
Methyl Ethyl Ketone (2-Butanone)	5,600 <sup>2</sup>	Molybdenum	100 <sup>2</sup>
Methylene Chloride	5 <sup>1</sup>	Perchlorate	14 <sup>2</sup>
Tetrachloroethene	5.0 <sup>1</sup>	Nitrate	10,000 <sup>1</sup>
Toluene	1,000 <sup>1</sup>	RDX	0.7 <sup>2</sup>
		HMX	1,000 <sup>2</sup>

1 Maximum Contaminant Levels (MCLs), EPA, 2017

2 EPA Regional Screening Levels (RSLs) for Tapwater, June 2017

3 The MCL for chloroform applies to the Total Trihalomethanes, which also include bromodichloromethane, bromoform, and dibromochloromethane

- IV.B.2. The Permittee shall collect and analyze samples from the groundwater monitoring system at least annually as described below:

- IV.B.2.a. Thirty (30) days prior to the collection of samples, the Permittee shall submit an annual Groundwater Monitoring Plan to the Director for approval. The monitoring plan shall include a list of monitoring wells and springs proposed for sampling, the constituents that will be sampled for in each well, a map highlighting the well locations, and the rationale for the proposed well selections and constituents.

IV.B.2.b. The Permittee shall collect and analyze samples from Shotgun and Pipe Springs semiannually, once in the Spring and once in the Fall. The Permittee shall submit the analytical results for spring samples collected in the Fall with the Annual Groundwater Monitoring Report (Condition IV.E.2). The results for the spring samples collected in the Spring shall be submitted to the Director in writing by the Permittee within ninety (90) days of collecting the samples.

IV.B.3. The Permittee shall not implement the proposed Groundwater Monitoring Plan without Director written approval. The Director may, upon written notification to the Permittee, require any or all of the monitoring wells, springs or piezometers listed in Table 1 of Attachment 4 be sampled for any or all of the constituents listed in Table IV-1.

**IV.C. GROUNDWATER PROTECTION STANDARD**

IV.C.1. The concentrations listed for each hazardous waste constituent in Table IV-1 shall comprise the groundwater protection standard. The Permittee shall sample and analyze the groundwater monitoring system for these constituents, as described in Condition IV.B.

IV.C.2. The Permittee may apply for Alternate Concentration Limits (ACL). A petition may be submitted if:

IV.C.2.a. The approved corrective measures, as described in Modules V and VI, fail to meet the groundwater protection standard defined by Condition IV.C.1., (Table IV-1) and the Permittee has demonstrated that all other technically feasible methods have been used to meet the concentration limits, or

IV.C.2.b. A risk assessment, conducted in accordance with R315-101, concludes that a contaminant concentration greater than the groundwater protection standard poses no unacceptable risk to human health or the environment.

IV.C.3. If submitted, the Director shall determine, the appropriateness of any ACL petition, and either accept, or reject, the proposed concentration level. If the Director determines that the level is appropriate, the Permittee shall initiate a modification to the permit in accordance with Condition I.E.2.

IV.C.4. The Permittee may request to have one or more constituents removed from the groundwater monitoring constituent list (Table IV-1). The Director shall determine if it is appropriate to remove constituent(s), based on the rationale provided by the Permittee and monitoring results. If the Director determines that it is appropriate to remove constituents as requested, the Permittee shall initiate a modification to the permit in accordance with Condition I.E.2.

IV.C.5. The Permittee shall use the SW-846 test methods and detection limits listed in



Table 1 of Attachment 3 to analyze groundwater samples. If an alternate test method is proposed, the Permittee shall request a permit modification in accordance with Condition I.E.2. If, at any time during the duration of this permit, the Director determines that the test methods specified in Attachment 3 are not sensitive enough to produce the required results, the Director may require the Permittee to use alternate test methods. If the Director requires a change to the test method(s), the Permittee shall modify the permit.

**IV.D. GROUNDWATER MONITORING REQUIREMENTS**

- IV.D.1 The Permittee shall comply with the following general requirements for groundwater monitoring:
- IV.D.1.a. The groundwater monitoring system shall consist of the wells, piezometers and springs specified in Table 1 of Attachment 4.
- IV.D.1.b. Existing monitoring wells shall be maintained in a fully operational condition for the duration of this permit. The Permittee shall notify the Director within seven days when a well is no longer properly functioning (including the presence of sandy or silty materials that impacts the well function and cracked or broken casings). The Director must approve in writing the conditions for replacement or correction of improperly operating well(s).
- IV.D.1.c. The Permittee shall measure the total depth of all groundwater monitoring wells that are completed in unconsolidated sediments (listed in Table 2, Attachment 3) every five years. Total well depth measurements shall be compared to the original total depths for each well and submitted to the Director with the Annual Groundwater Monitoring Report in the year following total well depth measurements. If a problem is observed, the Permittee shall follow the procedures described above in Condition IV.D.1.b. regarding notification and corrective procedures.
- IV.D.1.d. The permanent removal of any wells in the groundwater monitoring system (Table 1, Attachment 4) shall be approved by the Director in writing. A request for the removal of wells shall constitute a permit modification.
- IV.D.1.e. The Permittee shall install additional groundwater monitoring wells to maintain compliance with this Module if subsurface conditions significantly change after permit issuance. Such changes may include, but are not limited to, water level elevation or apparent flow direction changes, or detection of one of the hazardous constituents in a monitoring well. If hazardous waste constituents exceed the groundwater protection standard concentration limits, as defined in Section IV.C. of this Module, in the furthest most hydraulically down-gradient monitoring well(s), the Permittee shall install additional groundwater monitoring wells further down-gradient.

- IV.D.1.f. Upon notification by the Director in writing, or as a result of an enforcement action, the Permittee may be required to install and sample additional wells at any time during the post-closure or compliance periods if new information or unforeseen circumstances reveal a need for additional monitoring to protect human health and the environment.
- IV.D.1.g. The Permittee shall not add or remove any groundwater monitoring wells without prior written approval of the Director. The Permittee shall submit to the Director an application for a permit modification (for Attachment 4) within ninety (90) days of when new wells are added to or removed from the groundwater monitoring system.
- IV.D.2. The Permittee shall locate, install, construct, and maintain new groundwater monitoring wells as specified below:
- IV.D.2.a. Well construction shall follow the techniques described in the Technical Enforcement Guidance Document (TEGD), OSWER-9950.1, November 1992, or most current, approved edition. All monitoring wells shall be cased in a manner that maintains the integrity of the monitoring well bore hole. This casing shall be screened or perforated, and packed with gravel or sand, depending on the formation, to enable collection of groundwater samples. The annular space, the space between the bore hole and well casing above the sampling depth, shall be sealed with bentonite grout to prevent contamination of samples and the groundwater.
- IV.D.2.b. The Permittee shall construct and maintain new monitoring wells and piezometers in accordance with plans and specifications to be submitted to the Director for approval. The Director will approve in writing the following: number, location, depth, and design of all new wells and piezometers prior to installation.
- IV.D.2.c. The Permittee shall submit monitoring well completion reports within ninety (90) days after completion of any new wells installed. These reports shall, at a minimum, consist of the following components: a boring log that documents well drilling and associated sampling; a well construction log and well construction diagram (“as built”); well survey information for locations and elevations of the newly completed wells, the results of pump tests or slug tests, and a summary that discusses how the groundwater flow model shall be updated based on the data obtained from the installation of the new wells. The detailed information that shall be included for each of the four components is outlined in Attachment 5.
- IV.D.2.d. The Permittee shall properly dispose all contaminated groundwater generated during groundwater monitoring well sampling and during the development of new monitoring wells.
- IV.D.2.e. The Permittee shall permanently remove wells from the monitoring well system in accordance with the plugging and abandonment procedures described in the

Technical Enforcement Guidance Document (TEGD), OSWER-9950.1, November 1992, and subsequent addenda and as specified in Condition IV.D.1.d. above.

- IV.D.3. The Permittee shall include and maintain sampling and analysis procedures in the groundwater monitoring program that are designed to ensure reliable monitoring results. As required by R315-264-97(d), the program shall include procedures and techniques for:
- IV.D.3.a. sample collection;
  - IV.D.3.b. sample preservation and shipment;
  - IV.D.3.c. analytical procedures;
  - IV.D.3.d. chain-of-custody control; and
  - IV.D.3.e. quality assurance and quality control.
- IV.D.4. The sampling and analytical methods must be appropriate for groundwater sampling and accurately measure hazardous waste constituents in groundwater samples, as required by R315-264-97(e).
- IV.D.5. The Permittee shall use the following techniques and procedures when obtaining samples and analyzing samples from the groundwater monitoring wells, piezometers and springs:
- IV.D.5.a. The Permittee shall collect, preserve, and transport all samples from monitoring wells, piezometers and springs in accordance with the procedures specified in the Sampling and Quality Assurance Project Plans, presented in Attachment 3;
  - IV.D.5.b. Changes to the sampling or analysis procedures specified in Attachment 3, Module IV, or Module V, shall require a permit modification;
  - IV.D.5.c. The Permittee shall ensure all samples will be analyzed according to the test methods shown in Table 1 of the Groundwater Sampling and Analysis Plan, Attachment 3, or an equivalent EPA-approved method that has been pre-approved, by the Director in writing as per Condition I.G.13. In addition:
    - IV.D.5.c.i. All major analytical peaks greater than 25% of the peak height of the closest internal standard shall be identified using the most current National Bureau of Standards (NBS) Library. The quantity of these compounds shall be estimated and reported based upon the closest internal standard;
    - IV.D.5.c.ii. Any major analytical peak found during the analysis may become a target parameter for that constituent.

- IV.D.5.c.iii. All data shall be collected and validated as outlined in the Sampling and Quality Assurance Project Plans contained in Attachment 3. The Permittee shall resample all wells from which data is rejected.
- IV.D.5.c.iv. The Director may request at any time all laboratory QA/QC documentation and supporting data on any sampling episode in the previous 5 years. The raw organics information for required sampling and analysis, including organics gas chromatographic printouts, mass spectral analyses, and QA/QC surrogate and spiking results shall be retained by the Permittee at the Promontory facility and made available within fifteen (15) working days of request throughout the post-closure care period.
- IV.D.5.c.v. All samples shall be tracked and controlled using the chain-of-custody procedures specified in the Sampling and Quality Assurance Project Plans contained in Attachment 3.
- IV.D.5.c.vi. In case of loss of sample integrity (e.g. breakage, loss), resampling shall take place within seven days of the loss of sample integrity.
- IV.D.6. The Permittee shall determine the groundwater surface elevation in all monitoring wells listed in Table 4-A, Attachment 4 annually. The Permittee shall determine the groundwater surface elevation in the piezometers listed in Table 4-A, Attachment 4, on an as needed basis as determined by the Director.
- IV.D.7. The Permittee shall maintain a record of the piezometer locations and mark the locations of piezometers in the field so that they may be found as needed.
- IV.D.8. The Permittee shall, on an annual basis, construct maps of the potentiometric surface, based on the groundwater surface elevation data collected as described in Condition IV.D.6. If, based on annual monitoring, the Director determines that additional potentiometric data is needed, the Permittee shall install additional monitoring wells or piezometers.
- IV.D.9. The Permittee shall determine the groundwater flow rate and direction in the impacted aquifers based on groundwater surface elevation measurements. An updated potentiometric map shall be submitted to the Director on an annual basis as specified in Condition IV.E.2.
- IV.D.10. If the Director receives information indicating that the surveyed well casing elevations of the wells in the groundwater monitoring system, as specified in Condition IV.A.2., exceed 0.01 feet from a fixed datum the Permittee shall resurvey any or all of these well casing elevations.

- IV.D.11. The Permittee shall submit plume maps, as specified in Section IV.E. to show the concentration of hazardous constituents detected in impacted aquifers. Plume maps shall be submitted for the following constituents: trichloroethene, 1,1,1-trichloroethane, 1,1-dichloroethene, 1,1-dichloroethane, cis-1,2-dichloroethene, chloroform and perchlorate.

**IV.E. REPORTING AND RECORD KEEPING**

- IV.E.1. The Permittee shall keep a record of all monitoring, testing and analytical data obtained pursuant to the groundwater monitoring requirements contained in this Module. This data shall be managed as part of the Operating Record until closure of the facility in accordance with R315-264-73(b)(6).
- IV.E.2. The Permittee shall submit to the Director, for approval, annual Groundwater Monitoring Reports compiling the results of groundwater monitoring and assessing the effectiveness of the corrective action program. These reports shall be submitted no later than March 15 of each year and shall contain the following information:
- IV.E.2.a. An Introduction and list of wells describing the monitoring that was conducted, a summary of the analytical results and a description of the QA/QC results;
- IV.E.2.b. Results of sample analysis including the concentration of hazardous constituents, units of measurement, well or spring sampled, date sample was collected, the EQL and MDL;
- IV.E.2.c. Results of sample analysis for samples collected in the Fall from Pipe and Shotgun Springs;
- IV.E.2.d. QA/QC information including Case Narratives from the laboratory and Data Validation Reports as described in Section D2 of the QAPP (Attachment 3);
- IV.E.2.e. Measurements of static water levels as directed by Condition IV.D.6.;
- IV.E.2.f. Potentiometric surface maps of the impacted aquifer(s). This map shall indicate the rate and direction of groundwater flow, as indicated by Conditions IV.D.8. and IV.D.9.
- IV.E.2.g. Groundwater Monitoring Well Inspection Checklist (Attachment 2);
- IV.E.2.h. Total monitoring well depth data in the year following total well depth measurements for wells listed in Table 2, Attachment 3, as directed by Condition IV.D.1.c.
- IV.E.2.i. Plume maps showing contaminant concentrations of the impacted aquifers, as directed by Condition IV.D.11.;

- IV.E.2.j. Results of annual model recalibration and a summary analysis of annual model results, as directed by Conditions V.E.2. and IV.E.3.;
- IV.E.2.k. Identification of potential “hot spots”meriting attention for further evaluation (subsequent report will identify trends if any anomalies persist and propose corrective action or modification to the system).
- IV.E.3. If new groundwater surface or contaminant data does not show any discernable differences from the previous groundwater model calibration, and if the previous groundwater model calibration was deemed satisfactory by the Director, the Permittee may petition the Director to postpone the groundwater model recalibration for one year.
- IV.E.4. The annual groundwater monitoring reports identified in Conditions IV.E.2. through IV.E.2.k. shall also be submitted electronically. Data submitted electronically shall be in a format approved by the Director.

## **MODULE V - POST-CLOSURE GROUNDWATER CORRECTIVE ACTION**

### **V.A. POST-CLOSURE CORRECTIVE ACTION PROGRAM**

- V.A.1. The Permittee shall maintain a corrective action program as specified in R315-264-100. The purpose of this program shall be to remove or treat hazardous constituents in the groundwater and to monitor the migration of the hazardous constituents as outlined in Module IV. The corrective action program shall follow the requirements of R315-264-90, and this permit. The corrective action program is intended to be flexible and iterative; therefore, elements of the Corrective Measures Study (CMS) and Corrective Measures Implementation (CMI) may be combined or removed by the Permittee with the written approval of the Director.
- V.A.2. As part of the corrective action program, the Permittee shall maintain the groundwater flow and contaminant transport model approved by the Director. In accordance with R315-101, the Permittee shall continue to develop a human-health risk assessment until approved by the Director in writing.
- V.A.3. In accordance with R315-101, the Permittee shall continue to develop an ecological risk assessment until approved by the Director in writing.

### **V.B. CORRECTIVE MEASURE(S) STUDY**

- V.B.1. The Permittee shall submit a CMS to the Director for approval no later than ninety (90) days after approval of both the human-health and ecological risk assessments. The CMS shall include the following elements:
- V.B.1.a. An introduction describing the overall purpose of the CMS;
- V.B.1.b. A summary on the current conditions of the contaminant plume in the Area of Compliance, the findings of the groundwater flow/contaminant transport model and risk assessments;
- V.B.1.c. Corrective measure objectives, including proposed media cleanup standards;
- V.B.1.d. An evaluation of potential corrective measure technologies which includes an assessment of the long-term reliability, effectiveness and implementability of the alternatives;
- V.B.1.e. A detailed description of any proposed pilot, laboratory and bench scale studies (pilot or bench scale studies already conducted by the Permittee may be incorporated into the CMS);

V.B.1.f. A proposal for corrective measure(s) that shall satisfy corrective measure objectives, attain proposed media cleanup standards, control the sources of releases, and comply with applicable standards for the management of wastes; and

V.B.1.g. A Public Involvement Plan.

**V.C. CORRECTIVE MEASURE(S) IMPLEMENTATION**

V.C.1. Within ninety (90) days of written approval of the CMS by the Director, the Permittee shall submit a Corrective Measure Implementation Plan (CMI). The CMI Plan shall be submitted to the Director for written approval. The CMI Plan shall describe in detail how the approved corrective measure(s) for contaminated groundwater will be implemented. The CMI Plan shall include:

V.C.1.a. An introduction describing the overall purpose of the CMI Plan;

V.C.1.b. A summary/review of the approved corrective measure(s);

V.C.1.c. Design plans and specifications for the approved corrective measure(s);

V.C.1.d. A Construction Work Plan with construction quality assurance objectives;

V.C.1.e. An Operation and Maintenance Plan for the corrective measure(s);

V.C.1.f. A Groundwater Monitoring Plan to demonstrate the effectiveness of the corrective action program;

V.C.1.g. Corrective Measure(s) Completion Criteria to determine when corrective measure(s) have achieved the cleanup objectives;

V.C.1.h. Data management and documentation procedures;

V.C.1.i. Waste management practices;

V.C.1.j. An account of the permits required for the corrective measure(s);

V.C.1.k. A Public Involvement Plan; and

V.C.1.l. A schedule for the implementation of corrective measures.

V.C.2. Within thirty (30) days of approval of the CMI Plan by the Director, the Permittee shall implement the corrective measure(s) according to the schedule contained in the CMI Plan, and the Permittee shall update the Post-Closure Cost Estimate of Condition III.D. to account for any and all costs associated with the corrective measure(s) project.



**V.D. CORRECTIVE MEASURE(S) IMPLEMENTATION REPORT**

- V.D.1. Within ninety (90) days of completing construction of the corrective measure(s), the Permittee shall submit for the Director's approval in writing a Corrective Measure Implementation Report. In the report, the Permittee shall certify, in accordance with R315-270-11(b), that the project was built according to the design plans and specifications, and that the corrective measure(s) are performing adequately. The report shall also include, at a minimum, the following elements:
- V.D.1.a. A summary on the construction of the corrective measure(s), including any deviation or modification to the design plans and specifications;
- V.D.1.b. Construction quality assurance documentation; and
- V.D.1.c. As built drawings or photographs.

**V.E. OPERATION AND ASSESSMENT OF THE GROUNDWATER  
CORRECTIVE MEASURE(S)**

- V.E.1. The Permittee shall conduct corrective measure(s) as described in the approved CMI Plan.
- V.E.2. The Permittee shall recalibrate the groundwater flow and solute transport model annually. The results of the model recalibration and a summary analysis of the results shall be prepared by the Permittee and submitted as outlined in IV.E.2. If new groundwater surface or contaminant data does not show any discernable differences from the previous groundwater model calibration, and if the previous groundwater model calibration was deemed satisfactory by the Director, the Permittee may petition the Director to postpone the groundwater model recalibration for one year (IV.E.3.).
- V.E.3. The Permittee shall provide a summary on the effectiveness of the corrective action program in each annual report as required by Condition IV.E.2.
- V.E.4. If the Director determines that the Corrective Measure(s) Completion Criteria are not being attained, the Permittee shall modify the permit to install additional corrective measure(s) designed to achieve these cleanup goals. The modification request shall be submitted within ninety (90) days of the Director's determination.
- V.E.5. If the Permittee discovers that the corrective measure(s) are not operating as intended, or that operation of the corrective measures are adversely affecting the quality of the groundwater down-gradient, he shall notify the Director within seven days.

**V.F. DURATION OF CORRECTIVE ACTION PROGRAM**

- V.F.1. The Permittee shall prepare a Corrective Measure(s) Completion Report when the Permittee believes that the Corrective Measure(s) Completion Criteria have been attained. The purpose of the Corrective Measure(s) Completion Report is to fully document how the Corrective Measure(s) Completion Criteria have been met and to justify why the corrective measure(s) and/or groundwater monitoring may cease.
- V.F.2. The Permittee shall continue the corrective measures and groundwater monitoring until the Permittee receives written notification from the Director approving the request to cease corrective measure(s) and/or groundwater monitoring as proposed in the Corrective Measure(s) Completion Report.

**V.G. FINANCIAL ASSURANCE FOR CORRECTIVE ACTION**

- V.G.1. The Permittee shall be financially responsible for the development and implementation of the corrective action program.

**MODULE VI - CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS**  
**SCHEDULE OF COMPLIANCE**

**VI.A. CORRECTIVE ACTION PROGRAM**

- VI.A.1. The Permittee shall conduct corrective action in accordance with Module VI, for each Solid Waste Management Unit (SWMU) listed in Table 6-B, Attachment 6.
- VI.A.2. On or before January 15<sup>th</sup> of each year, the Permittee shall update Table 6-B, Attachment 6 to this permit, to specify the status of each SWMU. The most recent update to Table 6-B shall be maintained in the Operating Record and incorporated by reference into Module VI.
- VI.A.3. The Director may add SWMUs to Table 6-B, Attachment 6 of this permit, in accordance with Condition I.E.2. and Condition VI.K.
- VI.A.4. The Permittee shall submit a facility-wide ecological risk assessment to the Director for approval within 180 days of completing of the Corrective Action Program.

**VI.B. STANDARD CONDITIONS**

- VI.B.1. As specified in the conditions below, the Permittee shall submit all Corrective Action plans, reports, and schedules, in both hard copy and electronic format, to the Director for written approval. The Permittee shall revise and resubmit any Corrective Action plans, reports, and schedules as required by the Director in writing and within the time frames specified. Upon request by the Permittee, the Director may approve in writing an extension to any date to submit revised Corrective Action plans, report or schedules.
- VI.B.2. All plans for corrective action or interim action shall identify site-specific procedures for containment and classification of any hazardous waste that is expected to be generated. The Permittee shall manage waste generated as a result of a corrective action in a manner to minimize dispersion of the waste to the environment. The Permittee shall characterize all waste within ninety (90) days of generation/excavation.
- VI.B.3. Upon written approval by the Director, all final plans, schedules, and reports required by the conditions in Module VI are incorporated by reference into Module VI. Any non-compliance with such approved plans and schedules shall be deemed non-compliance with this permit and may be subject to enforcement action.

- VI.B.4. The Permittee shall notify the Director of planned fieldwork once the plan for the specific fieldwork has been approved by the Director. The Permittee shall notify the Director at least seven days prior to conducting any sampling or other activities specified in the approved plans and reports described in this Module.
- VI.B.5. All raw data, such as sample results, laboratory reports, drilling logs, bench scale or pilot scale data, survey data and other supporting information gathered or generated during activities undertaken pursuant to Conditions in this Module shall be maintained at ATK during the Post-Closure Care Period, unless the Director approves in writing alternate timeframes upon request of the Permittee. The Permittee shall provide copies of reports, logs, and other data to the Director upon request.

- VI.B.6. Failure of the Permittee to submit the information required in this Module or falsification of any information submitted to the Director is ground for enforcement action.

**VI.C. RCRA FACILITY INVESTIGATION**

- VI.C.1. The Permittee shall conduct a RCRA Facility Investigation (RFI) to determine the nature, magnitude and extent of known and suspected releases of hazardous wastes or hazardous constituents from each SWMU at the Facility, as identified in Table 6-B, Attachment 6. The data collected during the RFI shall be used to support the evaluation of risk to human health and the environment. The goal of the evaluation is to determine if additional investigation, corrective action, no further action, or site management is appropriate for each SWMU investigated. The Permittee shall conduct the RFI in accordance with this Module.
- VI.C.2. The Permittee has submitted RFI Work plans and a RFI Phase I Report for SWMUs as indicated in Table 6-B. Upon review of the Phase I Report by the Director, the Permittee shall, as directed by this Module, initiate additional investigation, implement corrective action, or take no further action for each SWMU included in the Phase I Report. The Permittee shall conduct the proposed action as approved by the Director.
- VI.C.3. By January 15<sup>th</sup> of each year, the Permittee shall submit, for Director written approval, annual schedules for the SWMUs to be investigated during the next reporting period. The annual update to Table 6-B, required by Condition VI.A.2, shall be included with the annual schedule. The schedule shall identify when the Permittee plans to conduct work or submit RFI, CAP, Interim Measure, or other work plans and reports as appropriate for the SWMUs identified in Table 6-B.
- VI.C.4. The Permittee shall notify the Director of all newly identified SWMUs in accordance with Section VI.K. of this Module.

- VI.C.5. Flexibility in the corrective action process may be allowed in order to promote efficiency. Therefore, elements of the RFI Work plans, Corrective Action Plans, Interim Measure Plans or their associated reports may be combined or removed by the Permittee upon written approval by the Director.

**VI.D. RFI WORK PLAN**

- VI.D.1. RFI Work plans, for SWMUs as identified in Table 6-B, shall be submitted to the Director for written approval. The objective of the RFI Work plan is to describe in detail how the nature, magnitude, and extent of known and suspected releases of solid and hazardous wastes and constituents will be determined. The Permittee shall implement all RFI Work plans according to the schedule provided in each RFI Work plan as approved by the Director in writing. The Permittee may modify the RFI implementation schedule upon written approval by the Director.
- VI.D.2. The RFI Work plan shall be developed based on a site-specific conceptual model for each SWMU or SWMU group and R315-101. Specifically, the RFI Work plan shall include:
- VI.D.2.a. A legal description or Global Positioning System (GPS) coordinates for the site;
  - VI.D.2.b. Historical land use and ownership of the site;
  - VI.D.2.c. Maps or aerial photos showing physical structures, buildings, spill areas, source areas or waste units as appropriate;
  - VI.D.2.d. Information and maps to describe the geology, hydrogeologic conditions and surface water at the site;
  - VI.D.2.e. An inventory of all current and past waste streams managed at the site, including process descriptions and suspected contamination source information;
  - VI.D.2.f. Data quality objectives;
  - VI.D.2.g. A Quality Assurance Plan that describes procedures for sampling and analysis activities, in accordance with the Attachment 3 QAPP, that will generate data that meets the data quality objectives. Site-specific data quality requirements shall be addressed as needed;
  - VI.D.2.h. Sampling and analysis plans; and
  - VI.D.2.i. A schedule for completing the investigation and for submitting the RFI Report.
- VI.D.3. Upon Director written approval, the Permittee shall implement the RFI according to the Work plan schedule.

**VI.E. RFI REPORT**

- VI.E.1. Upon completion of the RFI, the Permittee shall submit a RFI Report to the Director for written approval according to the RFI Work plan approved schedule. This schedule may be updated as needed based on the progress of the RFI. The RFI Report shall include:
- VI.E.1.a. All data collected during the RFI, including QA/QC information, and other relevant data held by the Permittee;
- VI.E.1.b. An analysis and summary of the investigation describing the nature, magnitude and extent of contamination at the site;
- VI.E.1.c. Maps, photos and diagrams as appropriate to show the site, sample locations and other relevant features;
- VI.E.1.d. Background concentrations of naturally occurring compounds as appropriate;
- VI.E.1.e. A discussion of the potential for impacts to human health and the environment considering contaminant migration pathways;
- VI.E.1.f. A discussion on data gaps and the need for collecting additional samples, if the Permittee recommends additional investigation;
- VI.E.1.g. A recommendation for additional investigation, corrective action, no further action, or site management for each SWMU investigated under the RFI Work plan;
- VI.E.1.h. A Human Health and Ecological Risk Assessment for each SWMU investigated under the RFI Work plan if the Permittee recommends no further action or site management; and
- VI.E.1.i. A schedule for submitting a Phase II RFI Work Plan, Corrective Action Plan, Site Management Plan or Human Health and Ecological Risk Assessment.

**VI.F. ADDITIONAL INVESTIGATION**

- VI.F.1. If the Permittee recommends additional investigation in the RFI Report, the Permittee shall submit a Phase II RFI Work Plan to the Director for written approval in accordance with Condition VI.E.1.i. The Phase II RFI Work Plan shall include:
- VI.F.1.a. An updated conceptual site model based on the results of the RFI;
- VI.F.1.b. Sampling and analysis plans for Phase II of the RFI;

- VI.F.1.c. Data quality objectives;
- VI.F.1.d. Other information as needed to achieve the objective of the RFI; and
- VI.F.1.e. A schedule for completing the investigation and for submitting the Phase II RFI Report.

**VI.G. CORRECTIVE ACTION**

- VI.G.1. If the Permittee recommends corrective action in the RFI Report or Phase II RFI Report, the Permittee shall submit a Corrective Action Plan to the Director for written approval in accordance with Condition VI.E.1.i.
- VI.G.2. The Director may approve the corrective action method proposed in the Corrective Action Plan, or may require a Corrective Measures Study be prepared and submitted to the Director for written approval.
- VI.G.3. If a corrective measures study is required, it shall include a summary of potential corrective action technologies evaluated by the Permittee. The Permittee shall address the long-term reliability, effectiveness and implementability of the alternatives.
- VI.G.4. The Corrective Action Plan (CAP) shall include:
  - VI.G.4.a. An introduction describing the overall purpose of the CAP;
  - VI.G.4.b. A summary of the current conditions and conceptual site model for SWMUs included in the CAP;
  - VI.G.4.c. Corrective action objectives, including proposed media cleanup standards;
  - VI.G.4.d. A proposal for corrective action that shall satisfy corrective action objectives, attain cleanup standards, control the sources of releases, and comply with applicable standards for the management of wastes;
  - VI.G.4.e. A detailed description of how the corrective action will be implemented;
  - VI.G.4.f. Engineering design plans and specifications for the corrective action, if applicable;
  - VI.G.4.g. An Operation and Maintenance Plan for the corrective action process, if applicable;
  - VI.G.4.h. Corrective action completion criteria to determine when corrective measures have achieved the cleanup objectives;

- VI.G.4.i. A monitoring plan, if applicable, that describes how the effectiveness of the corrective action will be assessed;
- VI.G.4.j. Detailed plans for confirmation soil sampling or other sampling as appropriate. Data quality objectives and a data quality assurance plan shall be included with the sampling plan. Site specific data quality requirements shall be addressed as needed; and
- VI.G.4.k. A schedule for the implementation of the corrective action and submittal of progress reports and final Corrective Action Report.
- VI.G.5. Upon written approval of the CAP, the Permittee shall implement the corrective action according to the schedule contained in the CAP.
- VI.G.6. The Permittee shall submit a Corrective Action Report in accordance with the schedule in the approved CAP. The Corrective Action Report shall include:
  - VI.G.6.a. A description of the corrective actions that were conducted, including any actions that deviated from the approved plan;
  - VI.G.6.b. An analysis and summary of the corrective action results and whether the approved corrective action objectives and cleanup standards were met;
  - VI.G.6.c. All data and quality assurance collected from confirmation or other sampling conducted to determine if cleanup standards have been met;
  - VI.G.6.d. Recommendations for additional corrective action, no further action, or site management for the SWMUs addressed in the Corrective Action Report; and
  - VI.G.6.e. A schedule for submitting a revised Corrective Action Plan or Human Health and Ecological Risk Assessments.

**VI.H. DETERMINATION OF NO FURTHER ACTION**

- VI.H.1. At any time during an investigation of a SWMU, the Permittee may petition the Director for a determination of no further action (NFA).
- VI.H.2. If the Permittee recommends NFA in the RFI Report, Phase II RFI Report, Interim Measures Report or after corrective action for a SWMU has been completed, the Permittee shall submit Human Health and Ecological Risk Assessments to the Director for written approval.
- VI.H.3. The Human Health and Ecological Risk Assessments shall be conducted in accordance with R315-101.
- VI.H.4. A proposal for NFA shall contain information based on the SWMU Assessment



Report, identified in Condition VI.K.2., the RFI Report, the Interim Measure Report, the Corrective Action Report or any other information that demonstrates that:

- VI.H.4.a. Hazardous waste or hazardous constituents are not detected; or
- VI.H.4.b. Hazardous waste or hazardous constituents have been detected, but are below background concentrations; or
- VI.H.4.c. Hazardous waste or hazardous constituents have been detected, but do not pose a threat to human health or the environment; in accordance with R315-101.
- VI.H.5. A determination of NFA, in accordance with Condition VI.H.1., shall not preclude the Director from requiring further investigations, studies, or remediation at a later date if new information or subsequent analysis indicates a release or potential of a release from a SWMU at the Permittee's facility.

**VI.I. SITE MANAGEMENT PLAN**

- VI.I.1. Any SWMU that does not meet the NFA requirements of Condition VI.H. following corrective action, or otherwise needs site management, as described in R315-101, shall be managed to control the risk to human health and the environment.
- VI.I.2. If the Permittee proposes site management for SWMUs that do not qualify for NFA, the Permittee shall submit to the Director for written approval a Site Management Plan (SMP). The SMP shall be based on the results of a Human Health and Ecological Risk Assessment conducted in accordance with R315-101. The Risk Assessments and Site Management Plan shall meet the requirements of R315-101 and at a minimum include the following:
  - VI.I.2.a. A description of the SWMU and summary of the site characterization as described in the RFI Report, including a summary of the magnitude, nature, and extent of the contamination;
  - VI.I.2.b. A summary of the conclusions of the Human Health and Ecological Risk Assessment, including identification of all potential receptors, and a conceptual model that describes the actual and potential human and environmental impact(s) from the residual contaminants at the site;
  - VI.I.2.c. A detailed description of how the risk at the SWMU will be managed to protect human health and the environment (e.g., fencing, inspection, maintenance, monitoring, etc.);
  - VI.I.2.d. An inspection program that will be used to monitor the SWMU or group of SWMUs to ensure that the site conditions have not changed and that the site

conceptual model is still appropriate. The inspection program shall include a description of what will be inspected, the inspection frequency, a description of what the inspector should evaluate, how to document and resolve problems, and an inspection checklist;

- VI.I.2.e. Photos and figures of the SWMU or group of SWMUs, as needed, to show the location, explain access, and highlight distinctive features;
- VI.I.2.f. An environmental covenant developed in accordance with Utah Code Section 57-25-101 et seq., and;
- VI.I.2.g. A legal description and survey plat of the property.
- VI.I.3. The Director may provide for public participation prior to approving a SMP as required by R315-101-7.
- VI.I.4. The Permittee shall implement the SMP within thirty (30) days of receipt of written approval by the Director. If approval of the SMP or environmental covenant is delayed, the Director may require the Permittee to begin inspection, maintenance, monitoring, or other activities prior to SMP approval.

**VI.J. INTERIM MEASURES**

VI.J. The Permittee shall notify the Director upon discovery of a release of hazardous constituents from a SWMU. If the Permittee or the Director determines that a release or potential release of hazardous waste or hazardous waste constituents from a SWMU poses a threat to human health or the environment, the Director may require the Permittee to perform interim measures. The Permittee may also voluntarily perform interim measures. In determining the need for interim measures, the Director or the Permittee shall consider the following:

- VI.J.1.a The actual or potential exposure to human or environmental receptors;
- VI.J.1.b. The potential for further environmental degradation without interim measures;
- VI.J.1.c. The presence of containers of hazardous waste, or hazardous waste constituents that may result in a release;
- VI.J.1.d. Presence and concentration of hazardous waste, or hazardous waste constituents in the soil that have the potential to migrate to surface or ground water;
- VI.J.1.e. Weather conditions that may promote the spread of contamination;
- VI.J.1.f. Risks of fire, explosion, or accident;
- VI.J.1.g. The time required to develop and implement a final remedy;

- VI.J.1.h. Funding, contracting, or other administrative situations; and
- VI.J.1.i. Other situations which may pose a threat to human health or the environment.
- VI.J.2. If the Director or the Permittee determines that interim measures are needed, the Permittee shall submit an Interim Measures Plan (IMP) for Director approval.
- VI.J.3. The IMP shall identify specific actions to be taken to implement the interim measures for removing the threat to human health or the environment. The IMP may be subject to public comment as determined necessary by the Director. The IMP shall include, but not be limited to the following:
  - VI.J.3.a. Proposed mitigation measures for the potential threat to human health and the environment that will be consistent with any long-term solution;
  - VI.J.3.b. Sampling and data collection plan, data quality objectives, and quality assurance plan;
  - VI.J.3.c. Design plans and specifications, construction requirements, operation and maintenance requirements, project schedules;
  - VI.J.3.d. Construction quality assurance objectives, inspection and documentation requirements; and,
  - VI.J.3.e. A schedule for the implementation of the interim measures and the submittal of progress reports and final Interim Measures Report.
- VI.J.4. Upon written approval by the Director, the Permittee shall implement the interim measures as described in the approved IMP.
- VI.J.5. The Permittee shall submit an Interim Measures Report to the Director for written approval in accordance with the schedule in the approved IMP. The Interim Measures Report shall include:
  - VI.J.5.a. A description of the interim measures that were conducted, including any measures that deviated from the approved plan;
  - VI.J.5.b. An analysis and summary of the interim measures results including whether the threat to human health or the environment was successfully removed or mitigated;
  - VI.J.5.c. All data and quality assurance collected from confirmation or other sampling conducted to determine if the objectives of the interim measures were met;
  - VI.J.5.d. Recommendations for additional corrective action, no further action, or site management for the SWMUs addressed in the Interim Measures Report;

- VI.J.5.e. A schedule for submitting a RFI Work plan, Corrective Action Plan or Human Health and Ecological Risk Assessment.

**VI.K. NOTIFICATION REQUIREMENTS FOR AND ASSESSMENT OF  
NEWLY IDENTIFIED SOLID WASTE MANAGEMENT UNITS**

- VI.K.1. The Permittee shall notify the Director in writing within thirty (30) days of discovery of any newly identified sites, which the Permittee believes may meet the definition of a SWMU. The notification shall include all available information about the site as needed to justify a decision about the status of the site.
- VI.K.2. Based on the information provided by the Permittee, and a possible site visit, the Director will determine whether the site should be declared a SWMU, or the site should be addressed through the interim measures process outlined in Section VI.J. of this Module (if managed as an interim measure the site does not need to be added to Table 6-B of Attachment 6).
- VI.K.3. If it is determined that the site should be declared a SWMU, it shall be addressed through the RFI process outlined in Sections VI.D. and VI.E. of this Module and it shall be added to Table 6-B when it is updated in accordance with VI.A.2.
- VI.K.4. Within thirty (30) days of making a decision as described in Condition VI.K.2., the Permittee shall provide a schedule for the submittal of an Interim Measures Plan or RFI Work Plan.

**VI.L. REPORTING REQUIREMENTS**

- VI.L.1. The Permittee shall submit to the Director written Semiannual Progress Reports of all activities conducted pursuant to the Conditions of Module VI.
- VI.L.2. The Semiannual Progress Reports shall be submitted each year on March 15<sup>th</sup> and September 15<sup>th</sup> and shall contain:
- VI.L.2.a. An update on the status of RFI work conducted with a description of the work completed;
- VI.L.2.b. Summaries of all problems or delays encountered during the reporting period and actions taken or to be taken to rectify problems; and
- VI.L.2.c. A description of any work that deviated from the approved RFI Work plan.
- VI.L.3. Upon written approval from the Director, the Permittee may receive extensions for report due dates for the submittals required by Module VI.

- VI.L.4. The Director may require the Permittee to conduct new or more extensive assessments, investigations, or studies, as needed, based on information provided in these progress reports or other supporting information.

**IV.M. FINANCIAL ASSURANCE FOR CORRECTIVE ACTION**

- IV.M.1. The Permittee shall be financially responsible for the development and implementation of the corrective action program in accordance with R315-264-101(b).

**IV.N. PUBLIC PARTICIPATION**

- IV.N.1. Prior to approving any RFI, CAP, IMP, SMP, or NFA petition, the Director may provide for public participation as defined by R315-101-7.

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## **ATTACHMENT 1**

### **SECURITY AND MAINTENANCE PLAN**

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## **POST- CLOSURE SECURITY AND MAINTENANCE PLAN**

### **I.A. Purpose and Scope**

The M-136 LTTAs, and Photographic Waste Discharge Sites at M-508 and M-636 are all Hazardous Waste Management Units (HWMUs) that have been closed with waste in-place. Post-closure security and maintenance requirements apply to these sites in accordance with R315-264-14 and R315-264-110. The security and maintenance requirements of this plan apply to the closed LTTAs and Photographic Waste Discharge Sites as outlined below.

### **I.B. Security**

The work performed at the ATK Launch Systems, Promontory facility primarily involves Department of Defense and NASA contracts; therefore, comprehensive security agreement measures have been instituted. These security measures include both a twenty-four hour surveillance system and an artificial barrier around the facility to minimize the possibility of unknown entry of livestock or personnel.

#### **I.B.1. Surveillance System**

Entry onto the facility is controlled at gates that are maintained by a trained security force. The security force also provides patrol, escort, and other activities within the facility. All plant entrances are manned by a minimum of one security officer twenty-four hours per day, every day. All other gates are locked and only used when authorized by attending Security. All employees entering the facility must show identification badges at the gate and wear them in plain sight throughout the day. All visitors and vendors are required to wear special identification badges.

#### **I.B.2. Artificial Barrier**

There are artificial or natural barriers surrounding the entire plant. The primary barrier consists of a chain link and barbed wire fence. The chain link fence runs along Highway 83 until it runs into the gully formed by Blue Creek just west of building M-46. A natural barrier is provided by the Blue Creek gully which is approximately 15 feet deep with near vertical sides. This barrier extends for approximately 8,000 feet to a five-foot, four-strand barbed wire fence. This fence extends to the north, changes to chain link, and runs around the north end of the Plant. The chain link fences are seven feet high and topped with barbed wire. This



fence is continued by a five-foot, four-strand barbed wire fence, which completes the primary barrier by encircling North Plant, Test, and Space Operations. Plant III is encircled by a five-foot, four-strand barbed wire fence and also has controlled access at the main entrance. Each hazardous waste management area also has an artificial barrier as described in the facility's Hazardous Waste Storage Permit.

In addition to the barrier described above, a five-foot, four strand barb wire fence surrounds the M-136 LTTAs. Access to the area is controlled by a gate which is locked when no one is present.

I.B.3. Warning Signs

Signs which read "DANGER, UNAUTHORIZED PERSONNEL KEEP OUT" shall be posted at the entrance gates to the LTTA and every 100 feet along the fence surrounding the LTTA and shall be maintained throughout the post-closure care period. The signs must be legible from a distance of at least 25 feet in accordance with R315-264-14(c).

Signs which read "HAZARDOUS WASTE MANAGEMENT UNIT – RESTRICTIONS ON LAND USE APPLY" shall be posted at entrances and every 100 feet around the designated area of HWMUs M-508 and M-636.

I.B.4. Activity and Use Limitations

The Permittee has closed the M-136 LTTAs with waste in place and the disposal areas have been capped. The M-508 and M-636 Photographic Waste Discharge Sites have both been closed with residual contamination remaining that exceeds standards for residential use.

The Permittee has entered into Environmental Covenants with the Director for the M-136 LTTAs and the M-508 and M-636 Photographic Waste Discharge Sites that establish their locations, the land use restrictions that exist at each and identify the contaminants that remain at the sites.

The Environmental Covenants run with the land and a Notice upon Conveyance is required that informs any new owner of the land use restrictions that apply to the sites. The Environmental Covenants were recorded with the Box Elder County Recorder and are included in this Attachment.

Based on an assessment of the human health risk associated with the contamination remaining at the M-508 and M-636 sites, no soil shall be removed from the surveyed confines of these areas. Use of the property at

the M-136 LTTA which will disturb the integrity of the caps, containment system, or groundwater monitoring system is prohibited.

I.C. Maintenance

This section describes the maintenance requirements for the M-136 LTTAs and Photographic Waste Discharge Sites at M-508 and M-636 during the post-closure care period. These requirements are in accordance with the State of Utah Hazardous Waste Management Rules R315-264-14, R315-264-110 and R315-264-228.

I.C.1. M-136 LTTAs Post-Closure Maintenance Requirements

In accordance with R315-264-228, post-closure maintenance of the M-136 LTTAs consists of the three primary requirements outlined below:

- I.C.1.a. The Permittee shall maintain the integrity and effectiveness of the final cover, or caps, including making repairs to the cap as necessary to correct the effects of settling, subsidence, erosion, or other events.
- I.C.1.b. The Permittee shall maintain and monitor the groundwater monitoring system (as directed by Module IV of this Permit).
- I.C.1.c. The Permittee shall prevent run-on and run-off from eroding or otherwise damaging the final cover, or caps. Run-on and run-off at the M-136 Burning Grounds and LTTA caps are controlled by diversion, collection ditches and trenches. Diversion ditches direct run-on around the M-136 area. Run-off is collected in a ditch on the west end of the area which drains towards a level spreader, storm water dispersion area. The diversion and collection ditches shall be kept clean of debris and vegetation that may prevent adequate drainage. If debris or vegetation is found in these structures during inspections that may result in inadequate drainage, action shall be initiated within seventy-two (72) hours to clear the drainage structures. The LTTA caps within the M-136 area are included in the ATK Launch Systems zone of engineering control.

I.C.2. M-508 and M-636 Photographic Waste Discharge Sites Post-Closure Maintenance Requirements

Post-closure maintenance of the M-508 and M-636 sites shall consist of the following primary requirements:

- I.C.2.a. The Permittee shall maintain the warning signs and other security equipment.
- I.C.2.b. The Permittee shall maintain and monitor the groundwater monitoring system (as directed by Module IV of this Permit).

I.D. Inspection Requirements for the M-136 LTTAs

The Permittee shall inspect, throughout the post-closure care period, the twelve M-136 LTTA caps, drainage ditches, security equipment and groundwater monitoring system as directed by Modules II and III and Attachment 2 of this Permit. All records of inspections and remedial actions shall be retained in the Operating Record, as indicated by Permit condition I.G.16. Repairs or corrective action for any deterioration or malfunction discovered by an inspection shall be initiated within seventy-two (72) hours except for damaged security equipment. As stated in Permit Condition II.B.3., repairs to damaged security equipment shall begin within twenty-four (24) hours. Repairs to security equipment shall be completed as soon as practicable, but not later than seventy-two (72) hours after the problem is discovered.



19 March 2009  
8200-FY09-091

Mr. Dennis R. Downs, Executive Secretary  
State of Utah Department of Environmental Quality  
Division of Solid and Hazardous Waste  
288 N.1460 W.  
P.O. Box 144880  
Salt Lake City, Utah 84114-4880

Attention: Jeff Vandel

Subject: M-136 Environmental Covenant

Dear Mr.Downs:

Attached is a file and date-stamped copy of the M-136 Environmental Covenant that has been recorded with Box Elder County. This is the final requirement, item #18, outlined in the Environmental Covenant.

Please contact me if you have any questions concerning this report. My telephone number is (435)863-8490 or you can contact Blair Palmer at (435)863-2430.

Sincerely

A handwritten signature in black ink, appearing to read "David P. Gosen", with a long horizontal flourish extending to the right.

David P. Gosen, P.E., Director  
Environmental Services

Enclosures: M-136 Environmental Covenant

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**To be recorded with County**  
**Recorder – Utah Code Ann § 57-25-108**

When Recorded Return To:  
✓ ATK Launch Systems Inc.  
P.O. Box 707,  
Brigham City, Utah 84302-0707

With Copy To:  
Dennis R. Downs, Executive Secretary  
Utah Solid and Hazardous Waste Control Board  
P.O. Box 144880  
Salt Lake City, UT 84114-4880

**ENVIRONMENTAL COVENANT**

1. This Environmental Covenant is entered into by **ATK Launch Systems Inc.**, a Delaware corporation, of P.O. Box 707, Brigham City, Utah 84302-0707 ("Owner") and the **Executive Secretary-DSHW of the Utah Solid and Hazardous Waste Control Board (Executive Secretary)** of P.O. Box 144880, Salt Lake City, UT 84114-4880 pursuant to Utah Code Ann. §§ 57-25-101 et seq. for the purpose of subjecting the Property described in paragraph 7, below, to the activity and use limitations set forth herein.

**Recitals**

2. Owner owns a parcel of land located in Box Elder County, Utah, which was the site of twelve hazardous waste management units referred to as the Liquid Thermal Treatment Area (LTTA's) contained within the M-136 burning grounds, and formerly used for disposal of wastewater generated from the manufacturing of solid rocket motors and other energetic products, regulated by the Utah Division of Solid and Hazardous Waste ("DSHW") under the Utah Solid and Hazardous Waste Act. Utah Code Ann. §§ 19-6-101 *et seq.*

3. As a result of these past disposal activities, soil in the disposal area was contaminated with the compounds that are listed in Exhibit "B". A map depicting the location of the twelve disposal sites located within the M-136 burning grounds is included in Exhibit "A", attached hereto and incorporated by reference herein.

4. These twelve Hazardous Waste Management Units were closed with waste in place and capped. Therefore, land use at these locations is restricted pursuant to Utah Administrative Code R315-8-7. The post-closure requirements for these sites are regulated by a Post-Closure Permit. The caps consist of a two layer cap, which acts to minimize infiltration, and which can safely conduct runoff from the cover without erosion. Specifically, the cover consists of a 24-inch clay-

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Environmental Covenant  
ATK Launch Systems Inc. Property M-136

bentonite layer and a 6-inch rip-rap rock layer. The clay-bentonite layer was selected to reduce infiltration of the gavelly-loam soil, which has a permeability of 2 to 6 inches/hour. The clay-bentonite layer reduces the permeability to less than  $1 \times 10^{-7}$  cm/sec. Additionally, the rip-rap rock layer was selected to protect the clay layer from erosion in lieu of a vegetative cover, as vegetation can become a fire hazard during the dry months. These covers are graded at either 3 or 4 percent to provide a positive drainage path to the area ditches.

5. The administrative record for this project consists of the closure documents for the twelve Liquid Thermal Treatment Areas (LTTA's) contained within the M-136 Burning Grounds at the ATK Launch Systems Inc. - Promontory facility and is located at the DSHW offices: 288 North 1460 West, P.O. Box 144880, Salt Lake City, Utah 84114-4880.

#### Environmental Covenant

Now therefore, Owner and the Executive Secretary agree to the following:

6. Environmental Covenant. This instrument is an environmental covenant developed and executed pursuant to Utah Code Ann. §§ 57-25-101 et seq.

7. Property. This Environmental Covenant concerns an approximately 0.669 acre tract of real property owned by Owner, located at Owner's site, in Box Elder County, Utah, and more particularly described in Exhibit A ("Property"). A map depicting the Property is also attached as part of Exhibit A.

8. Owner. ATK Launch Systems Inc. ("Owner"), whose mailing address is P.O. Box 707, Brigham City, Utah 84302-0707 is the owner of the Property.

9. Holder. Owner, whose address is listed above, is a holder of this Environmental Covenant.

10. Activity and Use Limitations. As part of the closure of a hazardous waste management unit on the Property, Owner hereby imposes and agrees to comply with the following activity and use limitations: 1) the Property shall not be used for any purpose that will disturb the integrity of the twelve LTTA caps or drainage ditches; and 2) no soil shall be removed from the Property without the prior approval of the Executive Secretary. If any event or action by or on behalf of a person or entity who owns an interest in or holds an encumbrance on the Property, identified in paragraph 11 below, constitutes a breach of the activity and use limitations, Owner or Transferee shall notify the Executive Secretary within thirty (30) days of becoming aware of the event or action, and, to the extent Owner or Transferee has the property rights necessary to do so, shall remedy the breach of the activity and use limitations within sixty (60) days of



Environmental Covenant  
ATK Launch Systems Inc. Property M-136

becoming aware of the event or action, or such other time frame as may be agreed to by the Owner or Transferee and the Executive Secretary.

11. Running with the Land. This Environmental Covenant shall be binding upon the Owner and all assigns and successors in interest, including any Transferee, and shall run with the land, pursuant to Utah Code Ann. § 57-25-105, subject to amendment or termination as set forth herein. The term "Transferee," as used in this Environmental Covenant, shall mean any future owner of any interest in the Property or any portion thereof, including, but not limited to, owners of an interest in fee simple, mortgagees, easement holders, and/or lessees.

12. Compliance Enforcement. Compliance with this Environmental Covenant may be enforced pursuant to Utah Code Ann. § 57-25-111. Failure to timely enforce compliance with this Environmental Covenant or the activity and use limitations contained herein by any party shall not bar subsequent enforcement by such party and shall not be deemed a waiver of the party's right to take action to enforce any non-compliance. Nothing in this Environmental Covenant shall restrict the Executive Secretary from exercising any authority under applicable law.

13. Rights of Access. Owner hereby grants to the Executive Secretary, his agents, contractors, and employees the right of access to the Property for implementation or enforcement of this Environmental Covenant; provided, however, access over Owner's property shall be through such contractor gates and control points as advised by Owner from time to time. Any and all access by the Executive Secretary, his employees and contractors, shall require all such persons to sign in at the designated security facility and comply with the Owner's safety and security standards. All persons leaving the Owner's property shall stop at the designated security gate and log out. It is expressly acknowledged that Owner reserves the right to change the access and control points and security and safety requirements from time to time, but Owner covenants at all times to use reasonable efforts to provide the Executive Secretary suitable access to the Property for evaluation of the implementation and enforcement purposes from time to time. While the Executive Secretary and his representatives will comply with Owner's reasonable safety and security requirements, nothing in this Environmental Covenant limits his authority to enter and inspect the property under Utah Code Ann. 19-6-109.

14. Notice upon Conveyance. Each instrument hereafter conveying any interest in the Property or any portion of the Property shall contain a notice of the activity and use limitations set forth in this Environmental Covenant, and provide the recorded location of this Environmental Covenant. The notice shall be substantially in the following form:

THE INTEREST CONVEYED HEREBY IS SUBJECT TO AN ENVIRONMENTAL COVENANT, DATED \_\_\_\_\_, 200\_, RECORDED IN THE DEED OR OFFICIAL RECORDS OF THE BOX ELDER COUNTY RECORDER ON \_\_\_\_\_, 200\_, IN [DOCUMENT \_\_\_\_, or BOOK \_\_\_\_, PAGE \_\_\_\_]. THE ENVIRONMENTAL COVENANT CONTAINS THE

FOLLOWING ACTIVITY AND USE LIMITATIONS: 1) the Property shall not be used for any purpose that will disturb the integrity of the twelve LTТА caps or drainage ditches; 2) no soil shall be removed from the Property without the prior approval of the Executive Secretary.

15. Owner shall notify the Executive Secretary within ten (10) days after each conveyance of an interest in any portion of the Property. Owner's notice shall include the name, address, and telephone number of the Transferee, a copy of the deed or other documentation evidencing the conveyance, and an unsurveyed plat that shows the boundaries of the property being transferred.

16. Representations and Warranties. Owner hereby represents and warrants to the other signatories hereto:

(a) that the Owner is the sole owner of the Property;

(b) that the Owner holds fee simple title to the Property which is free, clear and unencumbered.

(c) that the Owner has the power and authority to enter into this Environmental Covenant, to grant the rights and interests herein provided and to carry out all obligations hereunder;

(d) that the Owner has identified all other persons that own an interest in or hold an encumbrance on the Property and notified such persons of the Owner's intention to enter into this Environmental Covenant;

(e) that this Environmental Covenant will not materially violate or contravene or constitute a material default under any other agreement, document or instrument to which Owner is a party or by which Owner may be bound or affected; and

(f) to the extent that any other interests in or encumbrances on the Property conflict with the activity and use limitations set forth in this Environmental Covenant, the persons who own such interests or hold such encumbrances have agreed to subordinate such interests or encumbrances to the Environmental Covenant, pursuant to Utah Code Ann. §§ 57-25-103(4)(a) and the subordination agreement(s) (attached hereto as Exhibit C; [or] recorded at \_\_\_\_\_).

17. Amendment or Termination. This Environmental Covenant may be amended or terminated by consent of all of the following: the Owner, the current Transferee and the Executive Secretary pursuant to Utah Code Ann. § 57-25-110 and other applicable law. The term, "Amendment," as used in this Environmental Covenant, shall mean any changes to the Environmental Covenant, including the activity and use limitations set forth herein, or the elimination of one or more activity and use limitations when there is at least one limitation remaining. The term, "Termination," as used in this Environmental Covenant, shall mean the



elimination of all activity and use limitations set forth herein and all other obligations under this Environmental Covenant.

18. This Environmental Covenant may be amended or terminated only by a written instrument duly executed by the Executive Secretary, the Owner and the current Transferee of the Property or portion thereof, as applicable. Within thirty (30) days of signature by all requisite parties on any amendment or termination of this Environmental Covenant, the Owner or Transferee shall file such instrument for recording with the County Recorder's Office, and shall provide a file- and date-stamped copy of the recorded instrument to the Executive Secretary.

19. Severability. If any provision of this Environmental Covenant is found to be unenforceable in any respect, the validity, legality, and enforceability of the remaining provisions shall not in any way be affected or impaired.

20. Governing Law. This Environmental Covenant shall be governed by and interpreted in accordance with the laws of the State of Utah.

21. Recordation. Within thirty (30) days after the date of the final required signature upon this Environmental Covenant, Owner shall file this Environmental Covenant for recording, in the same manner as a deed to the Property, with the Box Elder County Recorder's Office.

22. Effective Date. The effective date of this Environmental Covenant shall be the date upon which the fully executed Environmental Covenant has been recorded as a document of record for the Property with the Box Elder County Recorder.

23. Distribution of Environmental Covenant. The Owner shall distribute a file- and date-stamped copy of the recorded Environmental Covenant to the Executive Secretary.

24. Notice. Unless otherwise notified in writing by or on behalf of the current owner or the Executive Secretary, any document or communication required by this Environmental Covenant shall be submitted to:

Dennis R. Downs, Executive Secretary  
Utah Solid and Hazardous Waste Control Board  
P.O. Box 144880  
Salt Lake City, Utah 84114-4880

and

ATK Launch Systems Inc.  
P.O. Box 707,  
Brigham City, Utah 84302-0707

The undersigned representative of Owner represents and certifies that he/she is

Environmental Covenant  
 ATK Launch Systems Inc. Property M-136

authorized to execute this Environmental Covenant.

**IT IS SO AGREED:**

**ATK Launch Systems Inc.**

*Kevin L. Cummings*  
 By: Kevin L. Cummings  
 Its: Executive Vice President &  
General Manager  
 STATE OF UTAH )  
 ) : ss.  
 COUNTY OF Salt Lake )

9/17/08  
 Date

Before me, a notary public, in and for said county and state, personally appeared Kevin Cummings a duly authorized representative of **ATK Launch Systems Inc.**, who acknowledged to me that he/she did execute the foregoing environmental covenant concerning ATK Launch Systems Inc. property commonly referred to as M-136 on behalf of **ATK Launch Systems Inc.**

*Eileen McCown*  
 NOTARY PUBLIC

My Commission Expires:



Residing at:

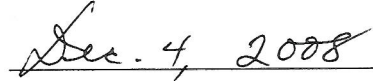
Utah

Intentionally left blank

**Utah Solid and Hazardous Waste Control Board**



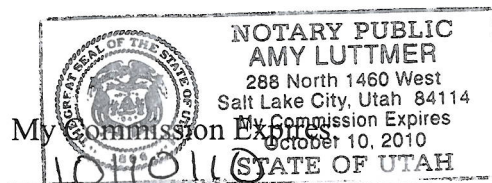
Dennis R. Downs, Executive Secretary



Date

STATE OF UTAH                    )  
  : ss.  
COUNTY OF SALT LAKE        )

Before me, a notary public, in and for said county and state, personally appeared Dennis R. Downs, Executive Secretary of the **Utah Solid and Hazardous Waste Control Board**, who acknowledged to me that he/did execute the foregoing instrument.



  
NOTARY PUBLIC

Residing at:  
288 N. 1400 W. SLC UT 84114

Environmental Covenant  
ATK Launch Systems Inc. Property  
Exhibit "A"

## EXHIBIT "A"

### The Property

M-136 Burning Grounds

Legal Description

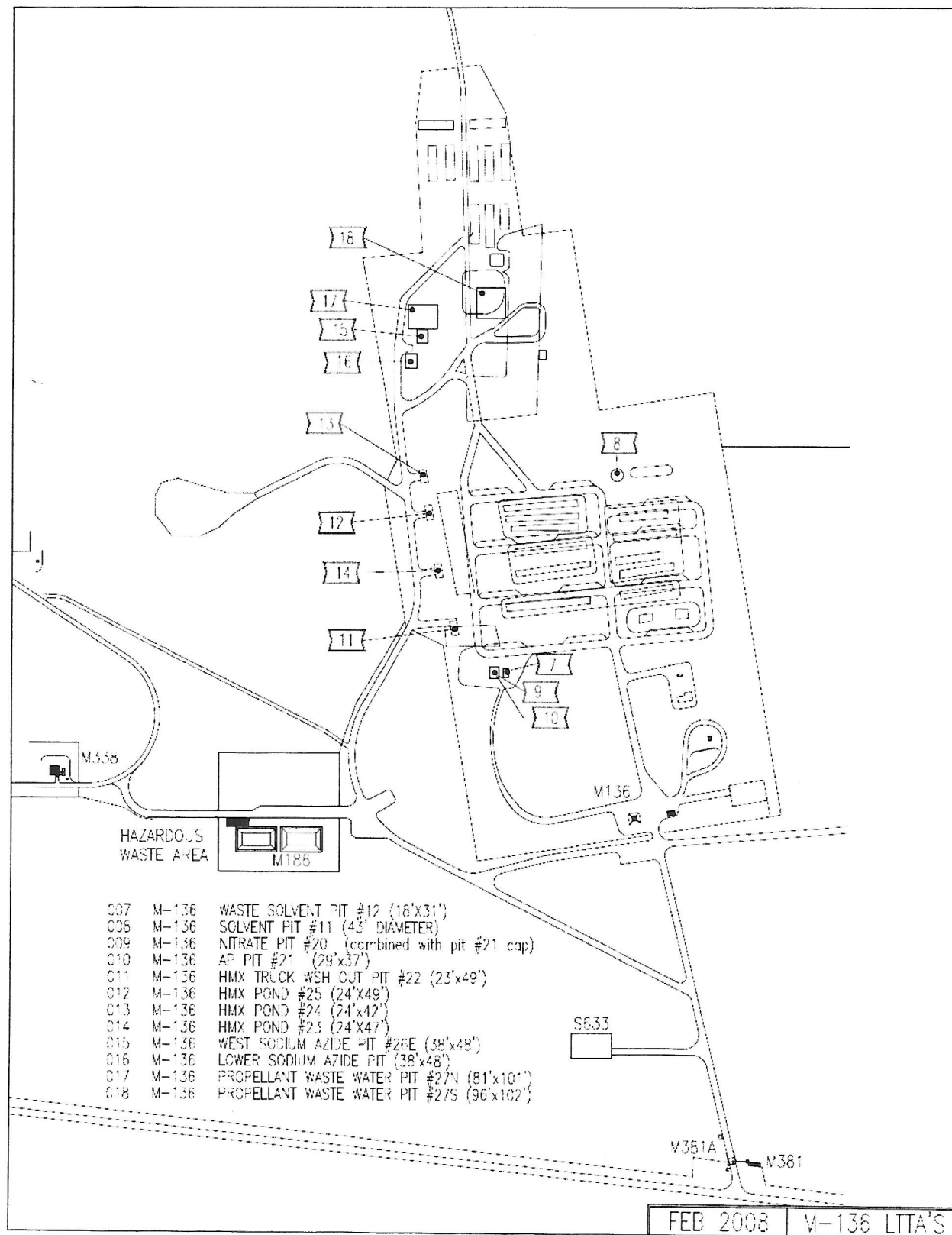
Note: the twelve Liquid Thermal Treatment Areas (LTTA's) are contained within the M-136 Burning Grounds described below

Beginning at the southwest corner of Section 8, Township 11 North, Range 5 West, bases of bearing on an assumed line true north to the northwest corner of Section 8, Township 11 North, Range 5 West, thence 4678.0 ft south 44° 02' 41" east, 3432.7 ft south 38° 15' 24" east, 2514.5 ft south 14° 49' 57" east, 819.8 ft south 30° 59' 25" east to the northeast fence post of the M-136 burning pits, along fence 308.9 ft south 7° 39' 57" east, along fence 418.3 ft south 83° 05' 21" west, along fence 156.3 ft south 8° 14' 17" east, along fence 704.6 ft south 81° 08' 40" west, along fence 234.5 ft south 4° 09' 19" east, 1343.5 ft south 76° 03' 49" west, along fence 998.0 ft north 8° 35' 32" west, along fence 1393.0 ft north 81° 21' 33" east, along fence 57.0 ft north 1° 33' 12" west, along fence 659.0 ft north 81° 14' 04" east, along fence 204.6 ft south 8° 52' 41" east, along fence 426.4 ft north 86° 32' 39" east to the northeast fence post, 819.8 ft north 30° 59' 25" west, 2514.5 ft north 14° 49' 57" west, 3432.7 ft north 38° 15' 24" west, 4678.0 ft south 44° 02' 41" west to beginning.

Environmental Covenant  
ATK Launch Systems Inc. Property M-136

### Map of the Property





Environmental Covenant  
ATK Launch Systems Inc. Property  
Exhibit "B"

## EXHIBIT "B"

### Compounds disposed of in the twelve LTТА's

#### Solvents

1,1,1 trichloroethane  
1,1 dichloroethane  
1,2 dichloroethane  
Trichloroethylene  
1,2 dichloroethylene  
Dichloromethane  
Trichloromethane  
Trichlorotrifluoroethane  
Toluene  
Acetone  
Methyl Ethyl Ketone  
Isopropyl Alcohol  
2-Butanol  
1,4-Dioxane  
1,3-Dioxolane  
1,2-Butadiene  
Nitromethane  
Butylene Oxide

#### Metals

Cadmium  
Chromium  
Lead  
Silver

Ammonium Perchlorate  
HMX  
NG  
sodium azide

Environmental Covenant  
ATK Launch Systems Inc. Property M-136

## **EXHIBIT "C"**

### **Encumbrances**



14 March 2008  
8200-FY08-066

Mr. Dennis R. Downs, Executive Secretary  
State of Utah Department of Environmental Quality  
Division of Solid and Hazardous Waste  
288 N.1460 W.  
P.O. Box 144880  
Salt Lake City, Utah 84114-4880

Attention: Jeff Vandel

Subject: M-508 Environmental Covenant

Dear Mr.Downs:

Attached is a file and date-stamped copy of the M-508 Environmental Covenant that has been recorded with Box Elder County. This is the final requirement, item #16, outlined in the Environmental Covenant.

Please contact me if you have any questions concerning this report. My telephone number is (435)863-8490 or you can contact Blair Palmer at (435)863-2430.

Sincerely

A handwritten signature in black ink, appearing to read "David P. Gosen". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

David P. Gosen, P.E., Director  
Environmental Services

Enclosures: M-508 Environmental Covenant

✓ When Recorded Return To:  
ATK Launch Systems Inc.  
P.O. Box 707,  
Brigham City, Utah 84302-0707

With Copy To:  
Utah Department of Environmental Quality  
Division of Solid and Hazardous Waste  
P.O. Box 144880  
Salt Lake City, UT 84114-4880

### ENVIRONMENTAL COVENANT

This Environmental Covenant is entered into by **ATK Launch Systems Inc.**, a Delaware corporation, of P.O. Box 707, Brigham City, Utah 84302-0707 ("Owner") and the **Utah Department of Environmental Quality**, and the **Utah Division of Solid and Hazardous Waste**, of P.O. Box 144880, Salt Lake City, UT 84114-4880 ("DEQ") pursuant to Utah Code Ann. §§ 57-25-101 et seq. for the purpose of subjecting the Property described in paragraph 2, below, to the activity and use limitations set forth herein.

### Recitals

Owner owns a parcel of land located in Box Elder County, Utah, which was a hazardous waste management unit referred to as M-508 and formerly used for disposal of wastewater generated from photo processing operations, regulated by the Utah Division of Solid and Hazardous Waste ("DSHW") under the Utah Solid and Hazardous Waste Act. Utah Code Ann. §§ 19-6-101 et seq.

As a result of these past disposal activities, soil in the disposal area was contaminated with silver. A map depicting the extent of this contamination is included in Exhibit "A", attached hereto and incorporated by reference herein. Soil sampling was conducted which detected maximum silver concentrations of 776 mg/kg.

The results of the soil sampling were evaluated under the Cleanup Action and Risk-Based Closure Standards at Utah Admin. Code R315-101 with respect to risk-based Preliminary Remediation Goals ("PRGs"). PRGs are risk-based concentrations considered by EPA and DSHW to be protective for humans over a lifetime based on residential or industrial exposure assumptions. The maximum silver concentration at the site is above the residential PRG for silver (390 mg/kg), but below the industrial PRG for silver (5,100 mg/kg), meaning that human health is expected to be protected if site use is limited to industrial. The industrial PRG for silver is based on an industrial exposure scenario under which soil containing silver is incidentally



ingested. Based on this evaluation, DSHW approved closure of the site based on "industrial use."

The administrative record for this project consists of the closure documents for unit M-508 at the ATK Launch Systems Inc. – Promontory facility and is located at the DSHW offices: 288 North 1460 West, P.O. Box 144880, Salt Lake City, Utah 84114-4880.

### **Environmental Covenant**

Now therefore, Owner and DEQ agree to the following:

1. **Environmental Covenant.** This instrument is an environmental covenant developed and executed pursuant to Utah Code Ann. §§ 57-25-101 et seq.
2. **Property.** This Environmental Covenant concerns an approximately .575 acre tract of real property owned by Owner, located at Owner's site, in Box Elder County, Utah, and more particularly described in Exhibit A ("Property"). A map depicting the Property is also attached as part of Exhibit A.
3. **Owner.** ATK Launch Systems Inc. ("Owner"), whose mailing address is P.O. Box 707, Brigham City, Utah 84302-0707 is the owner of the Property.
4. **Holder.** Owner, whose address is listed above, is a holder of this Environmental Covenant.
5. **Activity and Use Limitations.** As part of the closure of a hazardous waste management unit on the Property, Owner hereby imposes and agrees to comply with the following activity and use limitations: 1) the Property shall not be used for residential or day care purposes; and 2) no soil shall be removed from the Property without the prior approval of the Executive Secretary of the Utah Solid and Hazardous Waste Control Board. If any event or action by or on behalf of a person or entity who owns an interest in or holds an encumbrance on the Property, identified in paragraph 11 below, constitutes a breach of the activity and use limitations, Owner or Transferee shall notify the DEQ within thirty (30) days of becoming aware of the event or action, and, to the extent Owner or Transferee has the property rights necessary to do so, shall remedy the breach of the activity and use limitations within sixty (60) days of becoming aware of the event or action, or such other time frame as may be agreed to by the Owner or Transferee and DEQ.
6. **Running with the Land.** This Environmental Covenant shall be binding upon the Owner and all assigns and successors in interest, including any Transferee, and shall run with the land, pursuant to Utah Code Ann. § 57-25-105, subject to amendment or termination as set forth herein. The term "Transferee," as used in this Environmental Covenant, shall mean any future owner of any interest in the Property or any portion thereof, including, but not limited to, owners of an interest in fee simple, mortgagees, easement holders, and/or lessees.
7. **Compliance Enforcement.** Compliance with this Environmental Covenant may be enforced pursuant to Utah Code Ann. § 57-25-111. Failure to timely enforce compliance with

this Environmental Covenant or the activity and use limitations contained herein by any party shall not bar subsequent enforcement by such party and shall not be deemed a waiver of the party's right to take action to enforce any non-compliance. Nothing in this Environmental Covenant shall restrict the DEQ from exercising any authority under applicable law.

8. Rights of Access. Owner hereby grants to the DEQ, its agents, contractors, and employees the right of access to the Property for implementation or enforcement of this Environmental Covenant; provided, however, access over Owner's property shall be through such contractor gates and control points as advised by Owner from time to time. Any and all access by DEQ, its employees and contractors, shall require all such persons to sign in at the designated security facility, shall require a current site hazard training certificate by Owner security personnel and otherwise shall be subject to Owner's safety and security standards as advised and revised from time to time. All persons leaving the Owner's property shall stop at the designated security gate and log out. It is expressly acknowledged that Owner reserves the right to change the access and control points and security and safety requirements from time to time, but Owner covenants at all times to use reasonable commercial efforts to provide DEQ suitable access to the Property for implementation and enforcement purposes from time to time.

9. Notice upon Conveyance. Each instrument hereafter conveying any interest in the Property or any portion of the Property shall contain a notice of the activity and use limitations set forth in this Environmental Covenant, and provide the recorded location of this Environmental Covenant. The notice shall be substantially in the following form:

THE INTEREST CONVEYED HEREBY IS SUBJECT TO AN ENVIRONMENTAL COVENANT, DATED \_\_\_\_\_, 200\_, RECORDED IN THE DEED OR OFFICIAL RECORDS OF THE BOX ELDER COUNTY RECORDER ON \_\_\_\_\_, 200\_, IN [DOCUMENT \_\_\_, or BOOK \_\_\_, PAGE \_\_\_\_]. THE ENVIRONMENTAL COVENANT CONTAINS THE FOLLOWING ACTIVITY AND USE LIMITATIONS: 1) the Property shall not be used for residential or day care purposes; 2) no soil shall be removed from the Property without the prior approval of the Executive Secretary of the Utah Solid and Hazardous Waste Control Board.

Owner shall notify the DEQ within ten (10) days after each conveyance of an interest in any portion of the Property. Owner's notice shall include the name, address, and telephone number of the Transferee, a copy of the deed or other documentation evidencing the conveyance, and an unsurveyed plat that shows the boundaries of the property being transferred.

10. Representations and Warranties. Owner hereby represents and warrants to the other signatories hereto:

- (a) that the Owner is the sole owner of the Property;
- (b) that the Owner holds fee simple title to the Property which is subject to the interests or encumbrances identified in Exhibit "B" attached hereto and incorporated by reference herein;



(c) that the Owner has the power and authority to enter into this Environmental Covenant, to grant the rights and interests herein provided and to carry out all obligations hereunder;

(d) that the Owner has identified all other persons that own an interest in or hold an encumbrance on the Property and notified such persons of the Owner's intention to enter into this Environmental Covenant;

(e) that this Environmental Covenant will not materially violate or contravene or constitute a material default under any other agreement, document or instrument to which Owner is a party or by which Owner may be bound or affected; and

(f) to the extent that any other interests in or encumbrances on the Property conflict with the activity and use limitations set forth in this Environmental Covenant, the persons who own such interests or hold such encumbrances have agreed to subordinate such interests or encumbrances to the Environmental Covenant, pursuant to Utah Code Ann. §§ 57-25-103(4)(a) and the subordination agreement(s) (attached hereto as Exhibit C; [or] recorded at \_\_\_\_\_).

11. Amendment or Termination. This Environmental Covenant may be amended or terminated by consent of all of the following: the Owner, the current Transferee and the DEQ, pursuant to Utah Code Ann. § 57-25-110 and other applicable law. The term, "Amendment," as used in this Environmental Covenant, shall mean any changes to the Environmental Covenant, including the activity and use limitations set forth herein, or the elimination of one or more activity and use limitations when there is at least one limitation remaining. The term, "Termination," as used in this Environmental Covenant, shall mean the elimination of all activity and use limitations set forth herein and all other obligations under this Environmental Covenant.

This Environmental Covenant may be amended or terminated only by a written instrument duly executed by the DEQ, the Owner and the current Transferee of the Property or portion thereof, as applicable. Within thirty (30) days of signature by all requisite parties on any amendment or termination of this Environmental Covenant, the Owner or Transferee shall file such instrument for recording with the County Recorder's Office, and shall provide a file- and date-stamped copy of the recorded instrument to DEQ.

12. Severability. If any provision of this Environmental Covenant is found to be unenforceable in any respect, the validity, legality, and enforceability of the remaining provisions shall not in any way be affected or impaired.

13. Governing Law. This Environmental Covenant shall be governed by and interpreted in accordance with the laws of the State of Utah.

14. Recordation. Within thirty (30) days after the date of the final required signature upon this Environmental Covenant, Owner shall file this Environmental Covenant for recording, in the same manner as a deed to the Property, with the Box Elder County Recorder's Office.

15. Effective Date. The effective date of this Environmental Covenant shall be the date upon which the fully executed Environmental Covenant has been recorded as a document of record for the Property with the Box Elder County Recorder.

16. Distribution of Environmental Covenant. The Owner shall distribute a file- and date-stamped copy of the recorded Environmental Covenant to the DEQ.

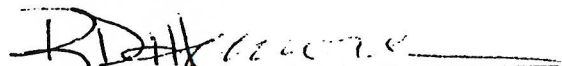
17. Notice. Unless otherwise notified in writing by or on behalf of the current owner or DEQ, any document or communication required by this Environmental Covenant shall be submitted to:

Utah Solid and Hazardous Waste Control Board  
Department of Environmental Quality  
P.O. Box 144880  
Salt Lake City, Utah 84114-4880  
Dennis R. Downs, Executive Secretary

The undersigned representative of Owner represents and certifies that he/she is authorized to execute this Environmental Covenant.

**IT IS SO AGREED:**

**ATK Launch Systems Inc.**




By: Ronald Dittmore  
Its: President

February 27, 2008  
Date

STATE OF Utah )  
COUNTY OF Salt Lake : ss.

Before me, a notary public, in and for said county and state, personally appeared Ronald D. Dittmer, a duly authorized representative of **ATK LAUNCH SYSTEMS INC.**, who acknowledged to me that he/she did execute the foregoing instrument on behalf of **ATK LAUNCH SYSTEMS INC.**

My Commission Expires: November 5, 2008  
NOTARY PUBLIC  
EILEEN MCCOWN  
201 South Main Suite 400  
Salt Lake City, UT 84111  
COMMISSION EXPIRES  
November 5, 2008  
STATE OF UTAH

Eileen McCown  
NOTARY PUBLIC

Residing at:

Salt Lake City, Utah

**Utah Department of Environmental Quality  
Division of Solid and Hazardous Waste**


Dennis R. Downs

Dennis R. Downs, Director  
Division of Solid and Hazardous Waste  
Executive Secretary,  
Utah Solid and Hazardous Waste Control Board

3/10/08  
Date

STATE OF UTAH )  
COUNTY OF SALT LAKE : ss.)

Before me, a notary public, in and for said county and state, personally appeared Dennis R. Downs, Director of the **Utah Division of Solid and Hazardous Waste** and Executive Secretary of the **Utah Solid and Hazardous Waste Control Board**, who acknowledged to me that he/did execute the foregoing instrument.

My Commission Expires: November 5, 2008  
NOTARY PUBLIC  
RONALD D. DITTMER  
1000 South Main Suite 400  
Salt Lake City, UT 84111  
COMMISSION EXPIRES  
November 5, 2008  
STATE OF UTAH

Ronald D. Dittmer  
NOTARY PUBLIC

Residing at:  
Salt Lake City, Utah



## **EXHIBIT "A"**

### **The Property**

#### **M-508 Waste Site Drain Field Legal Description**

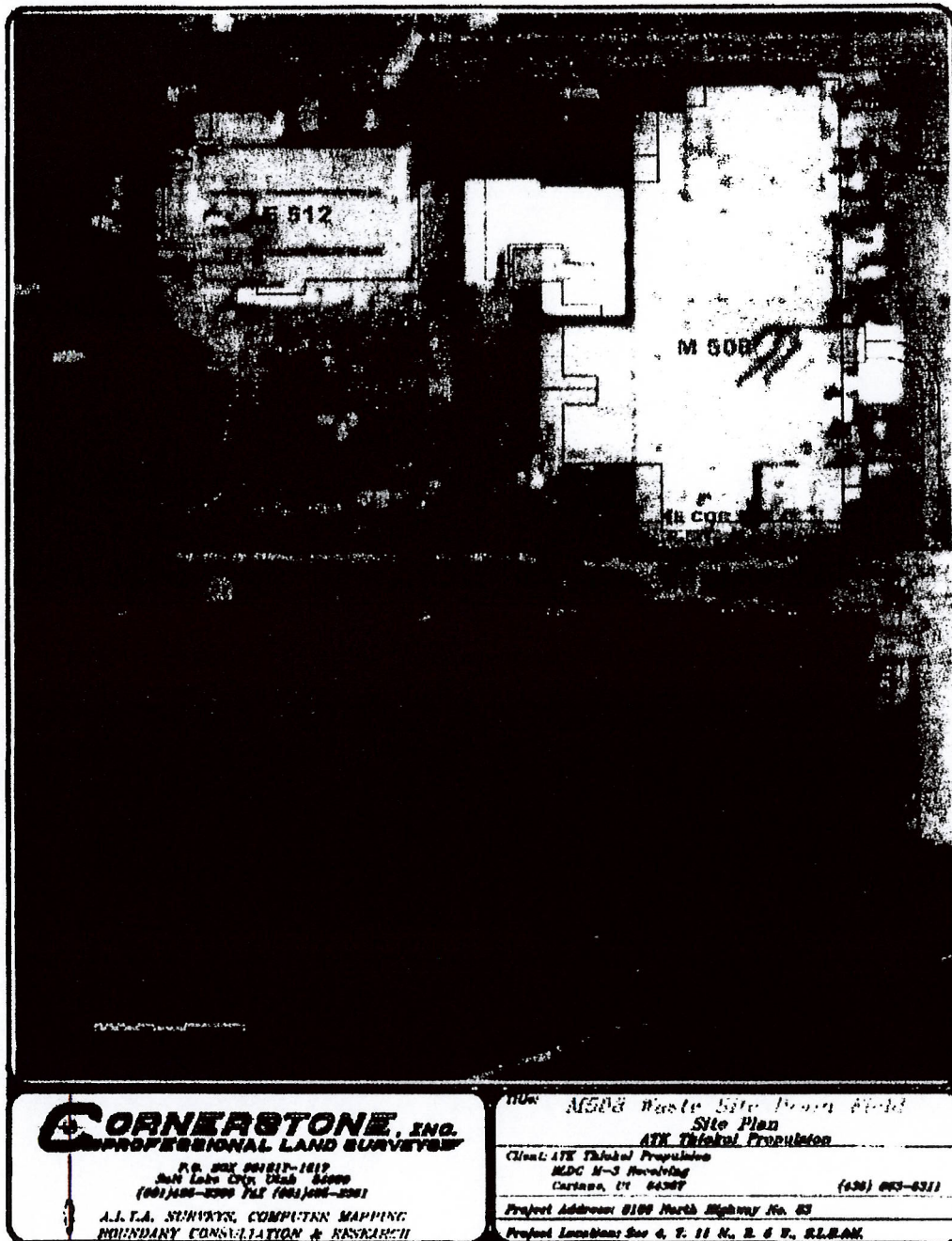
A Waste Site Disposal Drain Field from Building M-508 located in the Northwest Quarter of Section 4, in Township 11 North, Range 5 West, Salt Lake Base and Meridian, Box Elder County, Utah, described as follows:

COMMENCING AT the Northeast Corner of Section 4, Township 11 North, Range 5 West, Salt Lake Base and Meridian; thence along the east line of said Section 4 South 00°46'30" East 1107.61 feet and West 4184.92 feet to a 1-1/2" Brass Cap stamped "M-508 SW Corner Waste Site", said Brass Cap being the point of BEGINNING; thence North 110.00 feet; thence East 180.00 feet; thence South 180.00 feet; thence West 75.00 feet; thence North 70.00 feet; thence West 105.00 feet to the point of BEGINNING, containing 25050 square feet or 0.575 acres.

Prepared By: John B. Stahl, PLS  
Date: July 24, 2008  
Cornerstone Professional Land Surveys, Inc.  
P.O. Box 901617  
Salt Lake City, Utah 84090  
(801) 495-2360  
(801) 495-2361 fax



### Map of the Property



**EXHIBIT "B"**

**Encumbrances**

30 November 2007  
8200-FY08-047

Mr. Dennis R. Downs, Executive Secretary  
State of Utah Department of Environmental Quality  
Division of Solid and Hazardous Waste  
288 N.1460 W.  
P.O. Box 144880  
Salt Lake City, Utah 84114-4880

Attention: Jeff Vandel

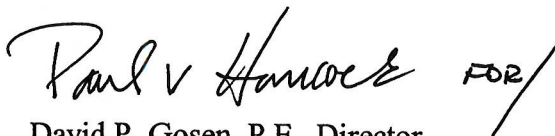
Subject: M-636 Environmental Covenant

Dear Mr.Downs:

Attached is a file and date-stamped copy of the M-636 Environmental Covenant that has been recorded with Box Elder County. This is the final requirement, item #16, outlined in the Environmental Covenant.

Please contact me if you have any questions concerning this report. My telephone number is (435)863-8490 or you can contact Blair Palmer at (435)863-2430.

Sincerely

A handwritten signature in cursive script that reads "David P. Gosen" followed by the word "FOR/" in a more stylized, possibly printed or semi-printed font.

David P. Gosen, P.E., Director  
Environmental Services

Enclosures: M-636 Environmental Covenant

When Recorded Return To:  
ATK Launch Systems Inc.  
P.O. Box 707,  
Brigham City, Utah 84302-0707

With Copy To:  
Utah Department of Environmental Quality  
Division of Solid and Hazardous Waste  
P.O. Box 144880  
Salt Lake City, UT 84114-4880

## ENVIRONMENTAL COVENANT

This Environmental Covenant is entered into by **Alliant Techsystems Inc.** by and through its subsidiary, **ATK Launch Systems Inc.**, a Delaware corporation, of P.O. Box 707, Brigham City, Utah 84302-0707 ('Owner') and the **Utah Department of Environmental Quality**, and the **Utah Division of Solid and Hazardous Waste**, of P.O. Box 144880, Salt Lake City, UT 84114-4880 ('DEQ') pursuant to Utah Code Ann. § 57-25-101 et seq. for the purpose of subjecting the Property described in paragraph 2, below, to the activity and use limitations set forth herein.

### Recitals

Owner owns a parcel of land located in Box Elder County, Utah, which was a hazardous waste management unit referred to as M-636 and formerly used for disposal of wastewater generated from photo processing operations, regulated by the Utah Division of Solid and Hazardous Waste ('DSHW') under the Utah Solid and Hazardous Waste Act. Utah Code Ann. §19-6-101 et seq.

As a result of these past disposal activities, soil in the disposal area was contaminated with cadmium and silver. A map depicting the extent of this contamination is included in Exhibit "A", attached hereto and incorporated by reference herein. Contaminated soil was removed from the site in 1995 incident to closure of the unit and a closure certification report was submitted following the removal action. Additional confirmation sampling was conducted in 2004, which detected maximum cadmium and silver concentrations of 5.9 mg/kg and 1,380 mg/kg, respectively.

The results of the soil sampling were evaluated under the Cleanup Action and Risk-Based Closure Standards at Utah Admin. Code R315-101 with respect to risk-based Preliminary Remediation Goals ('PRGs'). PRGs are risk-based concentrations considered by EPA and DSHW to be protective for humans over a lifetime based on residential or industrial exposure assumptions. The maximum cadmium concentration at the site is below the residential PRG for



cadmium (24 mg/kg), meaning that no restrictions on site use are necessary with respect to cadmium. The maximum silver concentration at the site is above the residential PRG for silver (390 mg/kg), but below the industrial PRG for silver (5,100 mg/kg), meaning that human health is expected to be protected if site use is limited to industrial. The industrial PRG for silver is based on an industrial exposure scenario under which soil containing silver is incidentally ingested. Based on this evaluation, DSHW approved closure of the site based on "industrial use."

The administrative record for this project consists of the closure documents for unit M-636 at the ATK Launch Systems Inc.-Promontory facility and is located at the DSHW offices: 288 North 1460 West, P.O. Box 144880, Salt Lake City, Utah 84114-4880.

### Environmental Covenant

Now therefore, Owner and DEQ agree to the following:

1. Environmental Covenant. This instrument is an environmental covenant developed and executed pursuant to Utah Code Ann. §57-25-101 et seq.
2. Property. This Environmental Covenant concerns an approximately .310 acre tract of real property owned by Owner, located at Owner's site, in Box Elder County, Utah, and more particularly described in Exhibit A (Property). A map depicting the Property is also attached as part of Exhibit A.
3. Owner. Alliant Techsystems Inc. by and through its subsidiary, ATK Launch Systems Inc. (Owner), whose mailing address is P.O. Box 707, Brigham City, Utah 84302-0707 is the owner of the Property.
4. Holder. Owner, whose address is listed above, is a holder of this Environmental Covenant.
5. Activity and Use Limitations. As part of the closure of a hazardous waste management unit on the Property, Owner hereby imposes and agrees to comply with the following activity and use limitations: 1) the Property shall not be used for residential or day care purposes; and 2) no soil shall be removed from the Property without the prior approval of the Executive Secretary of the Utah Solid and Hazardous Waste Control Board. If any event or action by or on behalf of a person or entity who owns an interest in or holds an encumbrance on the Property, identified in paragraph 11 below, constitutes a breach of the activity and use limitations, Owner or Transferee shall notify the DEQ within thirty (30) days of becoming aware of the event or action, and, to the extent Owner or Transferee has the property rights necessary to do so, shall remedy the breach of the activity and use limitations within sixty (60) days of becoming aware of the event or action, or such other time frame as may be agreed to by the Owner or Transferee and DEQ.
6. Running with the Land. This Environmental Covenant shall be binding upon the Owner and all assigns and successors in interest, including any Transferee, and shall run with the land, pursuant to Utah Code Ann. §57-25-105, subject to amendment or termination as set forth herein. The term "Transferee," as used in this Environmental Covenant, shall mean any future owner of

any interest in the Property or any portion thereof, including, but not limited to, owners of an interest in fee simple, mortgagees, easement holders, and/or lessees.

7. Compliance Enforcement. Compliance with this Environmental Covenant may be enforced pursuant to Utah Code Ann. § 57-25-111. Failure to timely enforce compliance with this Environmental Covenant or the activity and use limitations contained herein by any party shall not bar subsequent enforcement by such party and shall not be deemed a waiver of the party's right to take action to enforce any non-compliance. Nothing in this Environmental Covenant shall restrict the DEQ from exercising any authority under applicable law.

8. Rights of Access. Owner hereby grants to the DEQ, its agents, contractors, and employees the right of access to the Property for implementation or enforcement of this Environmental Covenant; provided, however, access over Owner's property shall be through such contractor gates and control points as advised by Owner from time to time. Any and all access by DEQ, its employees and contractors, shall require all such persons to sign in at the designated security facility, shall require a current site hazard training certificate by Owner security personnel and otherwise shall be subject to Owner's safety and security standards as advised and revised from time to time. All persons leaving the Owner's property shall stop at the designated security gate and log out. It is expressly acknowledged that Owner reserves the right to change the access and control points and security and safety requirements from time to time, but Owner covenants at all times to use reasonable commercial efforts to provide DEQ suitable access to the Property for implementation and enforcement purposes from time to time.

9. Notice upon Conveyance. Each instrument hereafter conveying any interest in the Property or any portion of the Property shall contain a notice of the activity and use limitations set forth in this Environmental Covenant, and provide the recorded location of this Environmental Covenant. The notice shall be substantially in the following form:

THE INTEREST CONVEYED HEREBY IS SUBJECT TO AN ENVIRONMENTAL COVENANT, DATED \_\_\_\_\_, 2006, RECORDED IN THE DEED OR OFFICIAL RECORDS OF THE BOX ELDER COUNTY RECORDER ON \_\_\_\_\_, 2006, IN [DOCUMENT \_\_\_\_\_, or BOOK \_\_\_\_\_, PAGE \_\_\_\_\_]. THE ENVIRONMENTAL COVENANT CONTAINS THE FOLLOWING ACTIVITY AND USE LIMITATIONS: 1) the Property shall not be used for residential or day care purposes; 2) no soil shall be removed from the Property without the prior approval of the Executive Secretary of the Utah Solid and Hazardous Waste Control Board.

Owner shall notify the DEQ within ten (10) days after each conveyance of an interest in any portion of the Property. Owner's notice shall include the name, address, and telephone number of the Transferee, a copy of the deed or other documentation evidencing the conveyance, and an unsurveyed plat that shows the boundaries of the property being transferred.

10. Representations and Warranties. Owner hereby represents and warrants to the other signatories hereto:



- (a) that the Owner is the sole owner of the Property;
  - (b) that the Owner holds fee simple title to the Property which is subject to the interests or encumbrances identified in Exhibit 'B' attached hereto and incorporated by reference herein;
  - (c) that the Owner has the power and authority to enter into this Environmental Covenant, to grant the rights and interests herein provided and to carry out all obligations hereunder;
  - (d) that the Owner has identified all other persons that own an interest in or hold an encumbrance on the Property and notified such persons of the Owner's intention to enter into this Environmental Covenant;
  - (e) that this Environmental Covenant will not materially violate or contravene or constitute a material default under any other agreement, document or instrument to which Owner is a party or by which Owner may be bound or affected; and
  - (f) to the extent that any other interests in or encumbrances on the Property conflict with the activity and use limitations set forth in this Environmental Covenant, the persons who own such interests or hold such encumbrances have agreed to subordinate such interests or encumbrances to the Environmental Covenant, pursuant to Utah Code Ann. §57-25-103(4)(a) and the subordination agreement(s) (attached hereto as Exhibit C; [or] recorded at \_\_\_\_\_).
11. Amendment or Termination. This Environmental Covenant may be amended or terminated by consent of all of the following: the Owner, the current Transferee and the DEQ, pursuant to Utah Code Ann. § 57-25-110 and other applicable law. The term, "Amendment," as used in this Environmental Covenant, shall mean any changes to the Environmental Covenant, including the activity and use limitations set forth herein, or the elimination of one or more activity and use limitations when there is at least one limitation remaining. The term, "Termination," as used in this Environmental Covenant, shall mean the elimination of all activity and use limitations set forth herein and all other obligations under this Environmental Covenant.

This Environmental Covenant may be amended or terminated only by a written instrument duly executed by the DEQ, the Owner and the current Transferee of the Property or portion thereof, as applicable. Within thirty (30) days of signature by all requisite parties on any amendment or termination of this Environmental Covenant, the Owner or Transferee shall file such instrument for recording with the County Recorder's Office, and shall provide a file- and date-stamped copy of the recorded instrument to DEQ.

12. Severability. If any provision of this Environmental Covenant is found to be unenforceable in any respect, the validity, legality, and enforceability of the remaining provisions shall not in any way be affected or impaired.

13. Governing Law. This Environmental Covenant shall be governed by and interpreted in accordance with the laws of the State of Utah.

14. Recordation. Within thirty (30) days after the date of the final required signature upon this Environmental Covenant, Owner shall file this Environmental Covenant for recording, in the same manner as a deed to the Property, with the Box Elder County Recorder's Office.
15. Effective Date. The effective date of this Environmental Covenant shall be the date upon which the fully executed Environmental Covenant has been recorded as a document of record for the Property with the Box Elder County Recorder.
16. Distribution of Environmental Covenant. The Owner shall distribute a file- and date-stamped copy of the recorded Environmental Covenant to the DEQ.
17. Notice. Unless otherwise notified in writing by or on behalf of the current owner or DEQ, any document or communication required by this Environmental Covenant shall be submitted to:

Utah Solid and Hazardous Waste Control Board  
Department of Environmental Quality  
P.O. Box 144880  
Salt Lake City, Utah 84114-4880  
Dennis R. Downs, Executive Secretary

The undersigned representative of Owner represents and certifies that he/she is authorized to execute this Environmental Covenant.

**IT IS SO AGREED:**

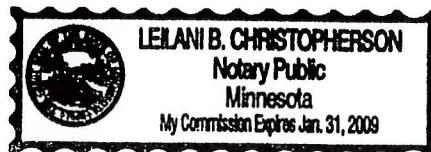
Alliant Techsystems Inc. by and through its subsidiary, ATK Launch Systems Inc.

Keith D. Ross  
By: Keith D. Ross  
Its: Senior Vice President + General Counsel

9/13/07  
Date



STATE OF )  
COUNTY OF Hennepin )  
: SS.



Before me, a notary public, in and for said county and state, personally appeared Keith D. Ross, a duly authorized representative of **ALLIANT TECHSYSTEMS INC. BY AND THROUGH ITS SUBSIDIARY, ATK LAUNCH SYSTEMS INC. INC.**, who acknowledged to me that he/she did execute the foregoing instrument on behalf of **ALLIANT TECHSYSTEMS INC. BY AND THROUGH ITS SUBSIDIARY, ATK LAUNCH SYSTEMS INC.**

Leilani Christopherson  
NOTARY PUBLIC

My Commission Expires: 1/31/2009

Residing at:

3512 Aldrich Ave. S, Mpls, MN  
55408

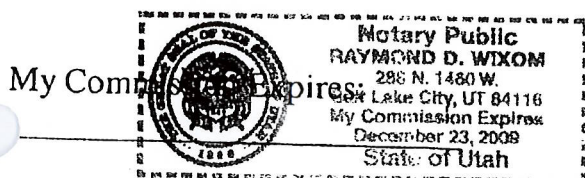
Utah Department of Environmental Quality  
Division of Solid and Hazardous Waste

Dennis R. Downs  
Dennis R. Downs, Director  
Division of Solid and Hazardous Waste  
Executive Secretary,  
Utah Solid and Hazardous Waste Control Board

9/17/2007  
Date

STATE OF UTAH )  
COUNTY OF SALT LAKE )  
: SS.

Before me, a notary public, in and for said county and state, personally appeared Dennis R. Downs, Director of the **Utah Division of Solid and Hazardous Waste** and Executive Secretary of the **Utah Solid and Hazardous Waste Control Board**, who acknowledged to me that he/did execute the foregoing instrument.



Raymond D. Wixom  
NOTARY PUBLIC

Residing at:

Utah Department of Environmental Quality

*[Signature]*

Dianne Nielson, Executive Director  
Utah Department of Environmental Quality

*Richard W. Sprotter*

STATE OF UTAH )

: ss.

COUNTY OF SALT LAKE )

Date

*10/19/07*

Before me, a notary public, in and for said county and state, personally appeared Dianne Nielson, the Director of the **Department of Environmental Quality**, who acknowledged to me that she did execute the foregoing instrument.

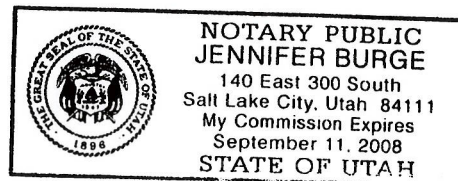
My Commission Expires:

*9-11-08*

*[Signature]*  
NOTARY PUBLIC

Residing at:

*Salt Lake City, Utah*



## EXHIBIT "A"

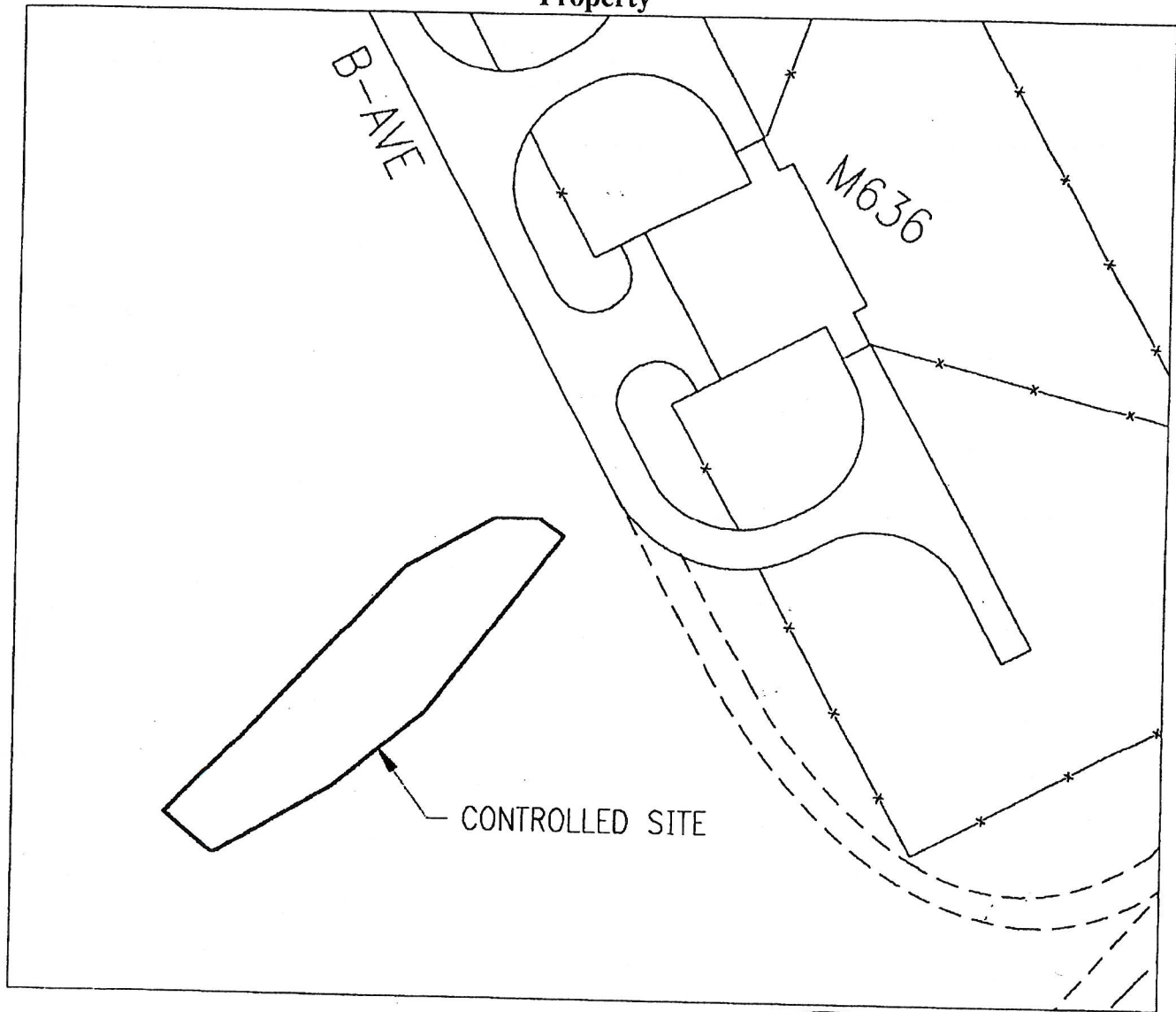
### The Property

THE FOLLOWING DESCRIBED PARCEL OF PROPERTY LOCATED IN BOX ELDER COUNTY, STATE OF UTAH:

BEGINNING AT A POINT SOUTH  $32^{\circ}24'28''$  WEST, 4341.15 FEET FROM THE NORTHEAST CORNER OF SECTION 9, TOWNSHIP 11 NORTH, RANGE 5 WEST, SALT LAKE BASE AND MERIDIAN; RUNNING THENCE SOUTH, 17.20 FEET; THENCE NORTH  $87^{\circ}30'23''$  WEST, 124.91 FEET; THENCE NORTH  $75^{\circ}13'45''$  WEST, 67.54 FEET; THENCE NORTH  $65^{\circ}39'41''$  WEST, 75.32 FEET; THENCE NORTH  $04^{\circ}46'03''$  EAST, 34.59 FEET; THENCE SOUTH  $82^{\circ}04'54''$  EAST, 191.93 FEET; THENCE SOUTH  $64^{\circ}44'39''$  EAST, 57.40 FEET; THENCE SOUTH  $34^{\circ}37'18''$  EAST, 24.35 FEET TO THE POINT OF BEGINNING.

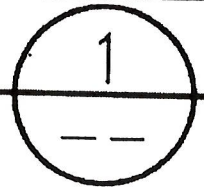
CONTAINING 0.310 ACRE, MORE OR LESS.

Map of the  
Property



M-636

SCALE: 1" = 100'-0"



## **EXHIBIT "B"**

### **Encumbrances**

## **ATTACHMENT 2**

### **INSPECTION SCHEDULES AND PROCEDURES**

Draft

## **INSPECTION SCHEDULES AND PROCEDURES**

### **II.A. Purpose and Scope**

Inspections of the M-136 LTTAs and Groundwater Monitoring System are conducted to promote the detection of malfunctions and deterioration of the LTTA caps, drainage systems, security equipment and monitoring wells. The inspection schedules have been designed to detect problems promptly in order to ensure that the caps, drainage systems and monitoring wells remain in good condition. The inspection schedules are also used to document problems observed and what corrective action or maintenance was conducted to remedy the problem. Inspections are conducted by personnel trained to identify potential problem areas and to use the inspection schedule/checklist. The Groundwater Monitoring System is inspected annually throughout the post-closure period. – the inspection schedule/checklist is shown below in Table II.B.

### **II.B. Remedial Action or Maintenance**

Repairs or corrective action for any deterioration or malfunction discovered by an inspection shall be initiated within seventy-two (72) hours except for damaged security equipment. As stated in Permit Condition II.B.3., repairs to damaged security equipment shall begin within twenty-four (24) hours. Repairs to security equipment shall be completed as soon as practicable, but not later than seventy-two (72) hours after the problem is discovered. As stated in R315-264-15(c), where a hazard is imminent or has already occurred, remedial action shall be taken immediately.

### **II.C. Inspection Records**

All records of inspections and remedial actions shall be retained in the Operating Record, as indicated by condition I.G.16., throughout the post-closure care period. At a minimum, inspection records shall include the date and time of the inspection, the name of the inspector, a notation of the observations made, and the date and nature of any repairs or maintenance taken.

### **II.D. Inspection of the M-136 LTTAs**

The twelve M-136 LTTAs shall be inspected quarterly throughout the post-closure care period. Inspections are also required within twenty-four (24) hours after a storm event. A storm event is defined as precipitation in excess of 1.0 inch in a one-hour period. It shall be documented in the inspection log that the inspection was conducted in response to a storm event. The items or areas that shall be inspected and the potential problems to watch for are included on the inspection schedule/checklist. A blank inspection schedule/checklist for the M-136 LTTAs is shown below in Table 2-A. Completed inspection schedule/checklists will be maintained in the operating record.

**TABLE 2-A**

<b>M-136 LTТА QUARTERLY POST CLOSURE INSPECTION CHECKLIST</b>													
INSPECTED BY		DATE		REVIEWED BY						DATE			
ITEM		LTТА AREAS											
		12	20	21	22	23	24	25	33	32	30	31	11
CAP SURFACE (CHECK IF INSPECTED)													
* TIRE RUTS, BURROWS, EROSION, ETC.													
* SIGNIFICANT VEGETATION													
* SETTLING OF CAP													
ANY CHECKS IN ROWS WITH AN * REQUIRES AN EXPLANATION. ALSO DESCRIBE CORRECTIVE ACTIONS TAKEN.		<b>EXPLANATION:</b>											
<b>CHECK WHEN INSPECTED</b>		<b>COMMENTS (NOTE PROBLEMS/CORRECTIVE ACTIONS)</b>											
DRAINAGE DITCH (WALK ENTIRE SYSTEM)													
INTERCEPTOR TRENCHES (SILTING)													
CULVERTS CLEAR													
DRAINAGE AREAS ( WASHED OUT)													
FENCES CONDITION													
GATES & LOCKS													
SIGNS ("DANGER UNAUTHORIZED PERSONNEL KEEP OUT")													
ROADWAYS IN SAFE CONDITION													
M-136 PHONE IN WORKING ORDER													
<input type="checkbox"/> CHECK HERE IF INSPECTION IS BECAUSE OF A STORM EVENT													
FORWARD COMPLETED FORM TO ENVIRONMENTAL SERVICES AT MAIL STOP 301													



II.E. Inspection of the Groundwater Monitoring System

The Permittee shall inspect, on an annual basis, all groundwater monitoring wells as identified in Attachment 4. The items that shall be inspected and the potential problems to watch for are identified on the Groundwater Monitoring System Annual Inspection Checklist that is used in the field. The inspection checklist is shown below.

Draft

<b>Inspected by:</b>	<b>Reviewed by / Date:</b>
----------------------	----------------------------

[illegible]

**For any problems note corrective action taken here**

# Quality Assurance Project Plan

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*For*

*Orbital ATK  
~Utah Facilities~*

## Approvals

Environmental Group

\_\_\_\_\_  
Kris Blauer  
Manager

\_\_\_\_\_  
Date

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## **A3 - Distribution List**

### Orbital ATK

Environmental Group

Analytical Laboratory

### State of Utah Department of Environmental Quality

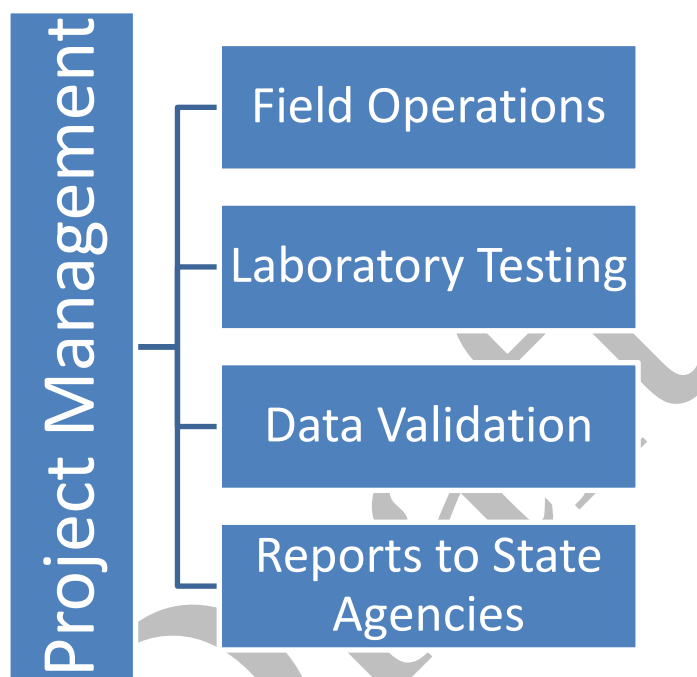
Division of Water Quality

Division of Solid and Hazardous Waste

## A4 – Project/Task Management

Project management responsibilities are detailed in this section, and are illustrated in Figure 1. Multiple functions may be performed by one individual.

**Figure 1**      **Project Organization**



### **PROJECT MANAGEMENT**

The role of Project Management / Project Manager (PM) is to direct the program with responsibilities which include:

- Ensuring timely resolution of project-related technical, quality, or waste management issues.
- Monitoring and evaluating laboratory performance.
- Coordinating and overseeing work performed by field and office technical staff (including data validation, statistical evaluations, and report preparation).
- Coordinating and overseeing maintenance of all project records.
- Approving the implementation of project corrective action.

### **Field Operations**

Field Operations activities include:

- Function as communications link between field staff members and laboratory personnel.
- Oversee the mobilization and demobilization of all field equipment and subcontractors.
- Coordinate and manage the Field Technical Staff.
- Ensure proper chain of custody protocol.
- Adhere to the work schedules.
- Be responsible for the maintenance of the site field logbook, and field recordkeeping.
- Initiate field task modification requests when necessary.
- Identify and resolve problems in the field; resolve difficulties; implement and document corrective action procedures, and provide communication between the field team and upper management.
- Monitoring QA policies and procedures.
- Conducting systems and performance audits to monitor compliance with environmental regulations, contractual requirements, QAPP requirements, and corporate policies and procedures.
- Auditing project records.
- Monitoring subcontractor quality controls and records.
- Document deviations from approved workplans
- Assisting in the development of corrective action plans; ensuring correction of nonconformance reported in internal or external audits.
- Overseeing the implementation of the QAPP.
- Overseeing and reviewing the development and revision of the QAPP.

### **Laboratory Testing**

The laboratory is responsible for maintaining accreditation with the State of Utah's Environmental Laboratory Certification Program as outlined in Utah Administrative Rule R444. The accreditation requirements include establishing a Quality Management System compliant with *ISO/IEC 17025 General requirements for the competence of testing and calibration laboratories*.

The laboratory will analyze all samples in accordance with the analytical methods and additional requirements specified in this QAPP. It also will be the analytical laboratory's responsibility to properly dispose of unused sample aliquots. Responsibilities of key laboratory personnel are outlined in the following paragraphs.

#### **Laboratory Director**

Responsibilities of the Laboratory Director include the following:

- Support the QA program within the laboratory.

- Provide management overview of both production and quality-related laboratory activities.
- Maintain adequate staffing and instrumentation to meet project analytical and quality objectives.
- Approve all laboratory Standard Operating Procedures (SOPs) and QA documents.

#### Laboratory Quality Assurance Officer

The Laboratory Quality Assurance Officer (QAO) has the overall responsibility for maintaining the Quality Management System of the laboratory. In addition, the Laboratory QAO will:

- Oversee laboratory QA.
- Oversee QA/QC documentation.
- Conduct detailed data reviews.
- Determine whether to implement laboratory corrective actions, if required.
- Define appropriate laboratory QA procedures.
- Approve laboratory SOPs.
- Approve Final Reports

#### Laboratory Sample Custodian

Responsibilities of the Laboratory Sample Custodian include the following:

- Receive and inspect the incoming sample containers.
- Record the condition of the incoming sample containers.
- Verify and sign COC.
- Assign a unique identification number and customer number, and enter each into the Laboratory Information Management System.
- Control and monitor access/storage of samples

#### Laboratory Technical Staff

The Laboratory Technical Staff will be responsible for sample analysis and identification of corrective actions. The staff will report directly to the Laboratory Director.

#### Data Validation

In addition to the data validation steps established within the laboratory as part of normal QA operations, third party validation of data may be required. The PM will coordinate getting the requested data from the laboratory to the data validators and will receive the validation summary report from the data validator. If there are questions that come up during the data validation process, the PM will act to resolve these questions. Third party validators will use this QAPP as a guide.

#### Reporting to State Agencies

The PM will collect data from the laboratory and any supporting documentation from field



operations and data validation activities and submit a report to the appropriate State Agency at the frequency required by permit or other agreement.

### A5 – Problem Definition/Background

The Orbital ATK facilities at the Bacchus and Promontory locations have known legacy environmental concerns which are regulated under corrective action permits. The permits require site characterization, remediation and monitoring activities the goal of which is to protect human health and the environment. To achieve this goal data must be of known and documented accuracy and precision so that sound environmental decisions can be made.

### A6 – Project/Task Description

This Quality Assurance Project Plan (QAPP) outlines the organization, objectives, and planned activities for the Quality Assurance/Quality Control (QA/QC) procedures associated with RCRA corrective action conducted at the Orbital ATK Bacchus and Promontory Facilities. These corrective actions include both soil investigations and groundwater monitoring. Corrective action is regulated at each facility by permits. These permits are listed in Table 1

**Table 1 - Corrective Action Permits at Bacchus and Promontory**

Facility	Soil Corrective Action	Groundwater Corrective Action
Bacchus	HAZARDOUS WASTE STORAGE PERMIT ALLIANT TECHSYSTEMS, INC. ATK LAUNCH SYSTEMS INC. BACCHUS FACILITY - PLANT 1 EPA ID# UTD001705029 MODULE IV – SWMU CORRECTIVE ACTION PROGRAM September 30, 2008	HAZARDOUS WASTE STORAGE PERMIT ALLIANT TECHSYSTEMS, INC. ATK LAUNCH SYSTEMS INC. BACCHUS FACILITY - PLANT 1 EPA ID# UTD001705029 MODULE V – GWMU CORRECTIVE ACTION PROGRAM September 30, 2008
Promontory	Hazardous Waste Post-Closure Permit ATK Launch Systems INC. Promontory EPA ID # UTD009081357 Module VI – Corrective Action For Solid Waste Management Units Reissued September 20, 2007	Hazardous Waste Post-Closure Permit ATK Launch Systems INC. Promontory EPA ID # UTD009081357 Module IV-Groundwater Monitoring Reissued September 20, 2007

Specific protocols for groundwater sample collection, sample handling and storage, chain-of-custody, laboratory and field analyses, data validation, and reporting are found or referenced in the permits listed above. Protocols for other media are addressed in site specific SAPs.

### A7 – Quality Objectives and Criteria

Data quality objectives (DQOs) are requirements needed to support decisions relative to various stages of the project. The data needs associated with this project have been developed based upon evaluation

of existing site data, requirements in the permits listed above, EPA risk screen and groundwater screen values and subsequent risk assessment needs. Specific data needs include collection of data to define the nature and extent of contamination, development of mean contaminant concentrations across the site and their potential for imparting public health risks and environmental impacts.

In the case of soil investigation activities, the specific concerns of each Solid Waste Management Unit (SWMU) is unique. Thus, it is important to establish Quality Objectives and Criteria that take the specific concerns into account. In the process of establishing a Sample Analysis Plan (SAP) a unique set of DQOs will be developed.

The DQO process is a systematic planning tool based on a logical method for establishing criteria for data quality. Establishing formal DQOs during the development of SAPs allows clear and unambiguous definitions of project objectives and decision criteria so that data of sufficient type, quality, and quantity are generated to meet project objectives. Details such as estimated quantitation limits (EQLs) used by the Laboratory will be provided in SAPs for each SWMU or group of SWMUs. In developing SAPs, the latest version of Guidelines for the Data Quality Objectives Process, US EPA, EPA QA/G-4, August 2000, or other appropriate guidelines will be followed.

The quality of the laboratory data is assessed in terms of **precision, accuracy, representativeness, comparability, and completeness**. Definitions of these parameters and the applicable quality control procedures are given below.

Precision - Precision is a measure of the degree to which two or more measurements are in agreement and describe the reproducibility of measurements of the same parameter for samples analyzed under similar conditions. A fundamental tenet of using precision measurements for QC is that precision will be bounded by known limits. Results outside these predetermined limits trigger corrective actions. Because of the inherent and unknown heterogeneity of soil samples, the precision of soil field duplicate samples will be used to gain a perspective on the natural heterogeneity of the soil.

Field precision is assessed by collecting and measuring field duplicates at a rate of 1 duplicate per 20 environmental samples submitted to the laboratory. Acceptance limits for field duplicate samples are:

- 30% relative percent difference for aqueous matrices, and;
- 50% relative percent difference for solid matrices.

This precision estimate encompasses the combined uncertainty associated with sample collection, homogenization, splitting, handling, laboratory and field storage, digestion or extraction, and analysis. In contrast, precision estimates obtained from analyzing duplicate laboratory samples incorporate only homogenization, subsampling, digestion or extraction, laboratory storage, and analysis uncertainties. Consequently, the field precision estimates (i.e., relative percent difference [RPD] values) should equal or exceed the laboratory precision estimates, on average, for each analyte. If field duplicate precision is significantly different from laboratory duplicate precision, the underlying cause will be investigated to

determine whether the observed difference could be artifacts of sampling and analysis. Considerations given to this effort include:

- The scale of subsampling for laboratory precision estimates relative to the scale of field duplicate sample size.
- Analytical measurement precision.
- Precision for repeat analysis of the same solid laboratory control sample (LCS).
- Estimated environmental sample grain size relative to LCS grain size.
- Potential natural soil heterogeneity.

Laboratory precision QC samples (i.e., laboratory duplicates for inorganic chemicals and MSDs for organic chemicals) will be analyzed with a minimum frequency of 5 percent (i.e., 1 QC sample per 20 environmental samples). Laboratory precision is measured by comparing RPD values with precision control limits. Precision limits for matrix spike/matrix spike duplicate and laboratory duplicate samples are displayed in Table 2.

When Precision data falls outside of the listed limits, the laboratory will flag the outlier and provide a comment relating the cause of the outlier and any effect it may have on the usability of the data. In cases where the data is not usable, the laboratory will notify the project manager in order to resolve the issue. In such cases, re-sampling and/or reanalysis may be required in order to obtain usable data for reporting.

Table 2 - Aqueous and Solid Relative Percent Difference Quality Control Limits for Laboratory Control Samples, Matrix Spikes, and Laboratory Duplicates

Analytical Method	Aqueous	Solid
	RPD	RPD
Explosives Method 8330A	30	50
Trace Metals Method 6010C or 6020A	20	50
Mercury Method 7470/7471	20	50
Perchlorate Method 314.0	20	50
Volatiles Method 8260B	20	50
Semivolatiles Method 8270D	30	50
Conductivity Method 9050A	20	50

**Accuracy** - Accuracy is a measure of the closeness of the measured value to the true value. The accuracy of chemical test results is assessed by "spiking" samples with known standards (surrogate or matrix spike) and establishing the average recovery. Accuracy measurements will be carried out in accordance with Contract Laboratory Program (CLP) Statement of Work (SOW) requirements for organic and inorganic analyses (USEPA CLP OLM04.3 and CLP ILM05.4, respectively) and at a minimum frequency of 1 per analytical batch of up to 20 samples per matrix analyzed (USEPA, 1991).

Accuracy requirements for field measurements are typically ensured through control over the sample collection and handling and through routine instrument calibration. Accuracy is also typically monitored through the use of blanks to detect cross-contamination and by monitoring adherence to procedures that prevent sample contamination or degradation. Accuracy also shall be assured qualitatively through adherence to all sample handling, preservation, and holding time requirements.

Accuracy in the laboratory is measured through the comparison of a spiked sample or LCS result to a known or calculated value and is expressed as a percent recovery (%R). It is also assessed by monitoring the analytical recovery of select surrogate compounds added to samples that are analyzed by organic chromatographic methods. MS and surrogate compound analyses measure the combined accuracy effects of the sample matrix, sample preparation, and sample measurement. LCSs are used to assess the accuracy of laboratory operations with minimal sample matrix effects. Post Digestion spikes (PDSs) are used to assess the accuracy of the analytical measurement on the sample extract or digestate. The parameters to be included in spiking mixes and accuracy limits are presented by analytical fraction and matrix in Table 3. LCS and MS analyses are performed at a frequency no less than 1 per 20 associated samples of like matrix. Laboratory accuracy is assessed via comparison of calculated %R values to accuracy control limits

When Accuracy data falls outside of the listed limits, the laboratory will flag the outlier and provide a comment relating the cause of the outlier and any effect it may have on the usability of the data. In cases where the data is not usable, the laboratory will notify the project manager in order to resolve the issue. In such cases, re-sampling and/or reanalysis may be required in order to obtain usable data for reporting.

**Table 3 - Laboratory Control Sample and Matrix Spikes Recovery Quality Control Limits for Aqueous and Solid Samples**

<b>Analytical Method</b>	<b>Aqueous</b>	<b>Solid</b>
	<b>% Recovery</b>	<b>% Recovery</b>
Explosives Method 8330A	80-120	80-120
Trace Metals Method 6010C or 6020A	75-125	75-125
Mercury Method 7470/7471	85-115	85-115
Perchlorate Method 314.0	85-115	85-115

Volatiles Method 8260B	80-120	80-120
Semivolatiles Method 8270D	70-130	70-130
Conductivity Method 9050A	90-110	90-110

Representativeness - Representativeness is an expression of the degree to which the data accurately and precisely represent a characteristic of a population or environmental condition existing at the site. Adherence to the project planning documents and use of standardized sampling, handling, preparation, analysis, and reporting procedures ensures that the final data accurately represent the desired populations.

To ensure representativeness of field data depends on the proper design of the sampling program and will be satisfied by ensuring that the project planning documents are followed and that proper sampling techniques are used.

In cases where alternative sampling techniques are employed, such as Multi-Incremental Sampling (MIS), to improve representativeness, it may be appropriate to establish data quality objectives specific to that technique. In such cases, the unique quality control requirements will be included in the sampling and analysis plan.

Representativeness in the laboratory is ensured or evaluated by using the proper analytical procedures, meeting sample holding times, and analyzing and evaluating field duplicate samples relative to laboratory duplicates.

Comparability - Comparability is defined as the confidence with which one data set can be compared with another (e.g., between sampling points and between sampling events). Comparability is achieved by using standardized sampling and analysis methods and data reporting formats (including use of consistent units of measure), and by ensuring that reporting and detection limits are sufficiently low to satisfy project detection and quantitation criteria for the duration of the project.

Comparability depends on the proper design of the sampling program and will be satisfied by ensuring that the project planning documents are followed and that proper sampling techniques are used.

Planned analytical data will be comparable when similar sampling and analytical methods are used and documented. Results will be reported in units that ensure comparability with previous data.

Common sources of data used to assess comparability may include: historical data and data obtained from split samples sent to a second party laboratory. Caution must be used when comparing data where dissimilar sampling and/or analysis techniques are employed. For example, when alternative sampling techniques are used such as Multi-Incremental Sampling (MIS) the data is not directly comparable to data obtained from discrete sampling. Similarly, data from Gas Chromatography using Flame Ionization Detectors is not directly comparable to Gas Chromatography using Mass Spectral

Detectors. While it may be useful to show data from two differing sampling and/or analysis techniques as a general comparison, any comparison needs to clearly indicate that the data sets were obtained using differing techniques and recommend that the end user should use caution when making comparisons.

Completeness - Completeness is defined as the percentage of measurements made which are judged to be valid measurements. Results will be considered valid if all the precision, accuracy, and representativeness objectives are met. The target completeness goal for this work is 90% (combined field and laboratory results) for a given analysis.

## **A8 – Special Training/Certification**

All field personnel will have appropriate training to conduct the field activities to which they are assigned.

The PM and all field staff, including subcontractors that will be performing work at the facility, shall have completed training that meets the requirements in OSHA 29 CFR 1910.120. Documentation and skills certification will be completed as described in OSHA 29 CFR 1910.120. No other certification or special training requirements are requisite for the completion of this project.

While no other formal training is required for the completion of this project, field safety and responsibilities will be reviewed prior to field sampling. The purpose of the review is to assign and review project-specific responsibilities related to field-sampling activities and to discuss any special conditions or problems that are anticipated such as weather, site access, and personal protective equipment (PPE) requirements. In addition, discussions and reviews of specific activities such as sample preservation, sample container requirements, and logbook completion may also be included. These discussions are brief summaries of the requirements contained in the SAPs.

Personnel will participate in the review based on their anticipated activity and responsibilities; for example, a driller would not necessarily be expected to participate in the portion of the review related to filling out a chain of custody form.

The Laboratory will maintain accreditation certificates for the testing involved through the State of Utah's Environmental Laboratory Certification Program.

## **A9 – Documents and Records**

The PM is responsible for initiating any revisions to planning documents and is responsible for making the needed revisions. The QAPP shall be approved by the Director of the Division of Waste Management and Radiation Control by an official letter from the Division. All revisions or modifications related to this QAPP thereafter will be accomplished by specifying a revision or modification to the QAPP in a SAP.

## **B – Data Generation and Acquisition**

### **B1 – Sampling Process Design**

For groundwater monitoring activities, the sampling sites and frequencies are established in the groundwater sections of the Bacchus and Promontory permits. For soil investigations, SAPs will be developed based on the unique data needs associated with the SWMUs and soil and soil gas sampling procedures will be addressed in the SAPs.

The primary purpose of the SAPs is to define the data quality objectives for each individual SWMU to be investigated. The SAPs will be developed based upon review of existing analytical data and process knowledge applicable to each SWMU or group of SWMUs. Table 4 is a checklist for consideration in developing specific SAPs. In addition, each SAP will contain a discussion of the components of the sampling strategy, listed below:

1. A methodology for selecting a sampling location and analytical parameters based on the data-quality objectives (DQOs);
2. A basis for selecting duplicate field samples;
3. Basis for selecting random sampling;
4. Locations within a SWMU where judgmental (biased) sampling is used based on process knowledge; and

The rationale for selecting the horizontal and vertical sample densities for each SWMU or group of SWMUs

Table 4 - Checklist for Developing Sampling and Analysis Plans

SAP Component	Specifications
Sampling	<p><b><u>Sampling Plan</u></b></p> <ul style="list-style-type: none"> <li>· Development of Data Quality Objectives</li> <li>· Sample Design/Strategy</li> <li>· List of Analytes</li> <li>· List of Sampling Locations</li> <li>· Analytical Methods</li> <li>· Analytical Procedures</li> <li>· Analytical Equipment</li> <li>· Standard Operating Procedures (SOPs) For Field-Investigation Activities (such as drilling, sample collection, decon, shipping etc.)</li> </ul> <p><b><u>Field Equipment</u></b></p> <ul style="list-style-type: none"> <li>· Selection of Sampling and Field Analysis Equipment</li> <li>· Operation &amp; Maintenance Procedures</li> <li>· Calibration &amp; Acceptance Criteria</li> <li>· Calibration Frequencies,</li> <li>· Decon Procedures</li> <li>· Investigation and Remediation Derived Waste Generation, Characterization, Management and Disposal</li> <li>· Field Data Sheets</li> <li>· Field Activity Daily Log</li> <li>· Field Instrumentation Log for Calibration and Maintenance</li> <li>· Procedure Variance Log</li> <li>· Photographs</li> <li>· Sample-Handling and Shipping Procedures</li> <li>· Containers &amp; Volumes</li> <li>· Holding Times &amp; Preservation Requirements</li> <li>· Sample Packaging &amp; Shipping</li> <li>· Sample Labels &amp; Sample Identification Number</li> <li>· Analytical Request and Chain of Custody Forms</li> <li>· Transfer of Custody from Field to Laboratory Receipt and Acceptance of Samples</li> </ul>
Quality Control	<p><b><u>Field</u></b> (as specified in sampling SOPs and SAPs)</p> <ul style="list-style-type: none"> <li>· Field Duplicates</li> <li>· Trip Blanks</li> <li>· Equipment Blanks</li> <li>· Field Blanks (soil, water)</li> </ul> <p><b><u>Laboratory</u></b></p> <ul style="list-style-type: none"> <li>· See the Laboratory Quality Assurance Plan (on file with the laboratory)</li> <li>· Assess need to add additional Matrix Spikes based on matrix</li> </ul>



SAP Component	Specifications
	types
Data Quality Objectives	<ul style="list-style-type: none"> <li>· Precision Level (as defined in the QAPP or customized limits based on unique SWMU or lab conditions)</li> <li>· Accuracy (as defined in the QAPP or customized limits based on unique SWMU conditions)</li> <li>· Representativeness – representativeness will be specified in each SAP.</li> <li>· Completeness</li> <li>· Comparability</li> <li>· Estimated Quantitation Limits</li> <li>· Clean-up Levels including based on DQOs (e.g., EPA screen values, MCLs)</li> </ul>

## B2 – Sampling Methods

Standard operating procedures (SOPs) are procedures developed by the PM and field staff for field sampling events. Most field SOPs have been developed for previous sampling and analyses events. The SOPs will be modified, as necessary, to meet data needs and usage requirements that are specified during the DQO development process. The SOPs will describe the process for preparation and decontamination of sampling equipment, including disposal of decontamination by-products; the selection and preparation of sample containers, sample volumes, and preservation methods; and maximum holding times to sample extraction and/or analysis. Procedures for groundwater are in the Bacchus and Promontory permits and Procedures for other media will be addressed are in the SAPs.

## B3 – Sample Handling and Custody

Written documentation of sample custody from the time of sample collection through the generation of data is recognized as a vital aspect of an environmental study. The Chain-of-Custody (COC) of the physical sample and its corresponding documentation will be maintained throughout the handling of the sample. All samples will be identified, labeled, and logged onto a COC or Request for Analysis form, as a part of the procedure designed to assure the integrity of the resulting data. The record of the physical sample, including the location and time of sampling, will be joined with the analytical results through accurate accounting of the sample custody. Sample custody applies to both field and laboratory operations. All laboratories completing chemical analyses will be required to maintain samples in a secure location with limited access from the time of sample receipt through sample disposal.

Samples collected will be either shipped to the laboratory via a commercial carrier or will be hand-delivered to the analytical laboratory when possible. All packaging materials and samples will be reviewed for compliance with changes in air shipment regulations when shipping by commercial carrier. If the samples are shipped via a commercial carrier, the following procedure will be used for packaging:

1. Inert cushioning material will be utilized when needed;

2. Sample containers will be sealed in re-sealable plastic bags and placed upright in the cooler;
3. Blue ice or wet ice and additional packaging materials will be placed around the containers;
4. Pertinent paperwork such as the COC/Request for Analysis form will accompany shipping papers;
5. When using a commercial provider a shipping label will be affixed to the outside of the cooler.

Upon arrival at the laboratory the Chain-of-Custody documents will be signed to relinquish/receive the samples. The sample packaging and sample integrity will be inspected by the laboratory personnel and the condition including temperature of samples will be documented. Any problem that may affect the outcome of the testing will be communicated to the customer at that time in order to determine if the samples will be tested or if a re-sample is needed. The communication and final decision with regard to testing will be documented.

#### **B4 – Analytical Methods**

Chemical analyses of samples will be completed by using specific laboratory methods in accordance with turn-around time for the completion of analyses and laboratory data reporting specified in SAPs. These methods may include analysis of explosives, volatile organic compounds (VOCs), semivolatile compounds, metals, and perchlorate. Samples will be collected and preserved as described in specific SAPs. Sample holding times are specific to each group of analytes and analytical methods. Holding times for specific samples shall be based on the date and the time of sample collection.

If holding times are exceeded, the laboratory will contact the project manager for direction on whether to analyze the samples out of holding time, (in which case a comment will appear on the final data report regarding the missed holding time), or whether resampling will be done to obtain data analyzed within the recommended holding time.

All laboratories involved will be required to read and comply with the QAPP and SAPs before analyzing samples.

The laboratories chosen to complete the analyses shall not subcontract any portion of the work without prior written approval from the PM. The laboratory shall use analytical equipment and procedures to produce data that will meet the DQOs and requirements as specified in SAPs.

If non-standard analytical methods are proposed for use, the method must be approved by the Division in writing. Detailed descriptions of the analytical method shall be reviewed to ensure that data generated by the method will meet the minimum data quality objectives and requirements as specified in SAPs for a SWMU or a group of SWMUs. The review will focus on the method as supplied by the analytical lab including scope, requirements, applicable documents, materials and equipment, operations, QC limits, detection limits, QA/QC measures, safety, sample preparation and analysis. The data validation process for data generated by the method shall follow the protocol specified in this QAPP and in the pertinent SAP.

## **B5 – Quality Control**

Quality Control checks of both the field sampling procedures and laboratory sample analyses will be used to assess and document data quality and to identify discrepancies in the measurement process that need correction. The minimum analytical laboratory QC samples to be considered for inclusion in the SAPs is provided in Table 4.

Quality control samples will be used to assess various data quality parameters such as representativeness of the environmental samples, the precision of sample collection and handling procedures, the thoroughness of the field equipment decontamination procedures, and the accuracy of laboratory analyses. To evaluate bias and contamination from field-collection procedures, appropriate soil or water blanks will be prepared. In addition, all sample containers, preservation methods, and holding times will be in accordance with QC requirements, as specified in SAPs.

The analytical laboratory will use a series of QC samples as identified in the laboratory QAP and specified in the standard analytical methods. The types of samples include method blanks, surrogate spikes, laboratory control samples, laboratory control sample duplicates, matrix spikes, and matrix spike duplicates. Analyses of QC samples will be performed for samples of similar matrix type and concentration and for each sample batch.

For QC purposes, the laboratory generally categorizes samples into two matrix types: aqueous and solids; which often encompasses a wide variety of matrix types. If for any reason a narrower definition of a matrix is desired (e.g. Clay vs Silty samples being separated), the laboratory may be instructed to spike discrete samples. This should be clearly communicated to the laboratory as it will most likely be different from the standard protocol.

### **Field Quality Control**

#### **Field Quality Control Checks**

Field equipment, if used, will be calibrated as frequently as recommended in the manufacturer's specifications. Each calibration including the results will be documented in the field logbook or on a data sheet developed for calibration and signed by the PM. Additionally, quality control samples will be collected during environmental sampling activities. Each type of field quality control sample is defined below.

#### *Field Duplicate Samples*

A field duplicate sample is a second sample collected at the same location as the sample designated for collection. Field duplicate sample results are used to assess precision, including variability, associated with both the laboratory analysis and the sample collection process. Field duplicate and regular samples will be collected simultaneously at a rate of 5% or at least one per project, from the same sample interval, providing sufficient material exists, and treated in an identical manner during storage,

transportation, and analysis. When recovery of soil from sampling operations is sufficient, field duplicate samples will be collected at a frequency to be specified in specific SAPs.

#### *Trip Blanks*

A trip blank is a sample of distilled and/or deionized, organic-free water preserved with 0.2 ml of HCl provided in three VOC bottles (and may vary in the specific SAPs). Trip blanks will be prepared only for the analysis of VOCs and will be subjected to the same handling as the other samples. The trip blanks will serve to identify contamination from sample containers or transportation and storage procedures. A trip blank will accompany each cooler of samples sent to the laboratory for the analysis of VOCs. If the travel time is brief (e.g. less than 2 hours) this may not be required.

#### *Equipment Blanks*

Equipment blanks are collected and analyzed to determine any level of contamination potentially introduced into samples due to the equipment cleaning technique. Equipment blanks will be collected if required in the SAP. General procedures for collecting equipment blanks are as follows (and may vary in the specific SAPs):

Following the collection of a designated sample, the sample collection device will be cleaned using a phosphate-free detergent and rinsed with water. The device will be inspected to ensure it has been thoroughly cleaned and rinsed.

When detailed by specific SAPs, a sample of the equipment sample device rinse water will be collected using the following additional steps:

- (1) Collect a sample from the final rinse. Collect the water off the equipment being rinsed into the required sample bottle(s);
- (2) Submit the equipment blank for analysis of all waste constituents sampled at the site. This equipment blank will be used to help quantify the potential for cross-contamination between samples due to improperly cleaned sampling devices;
- (3) Drum all wash and rinse water generated at the site for characterization and probable permitted discharge to a sanitary sewer; and
- (4) Obtain fresh wash water and rinse water from for cleaning operations at different site.

At the completion of sampling operations, all sampling equipment (augers, drill rods, sampling devices, tools, etc.) will be pressure washed. Any additional requirements for equipment blanks will be specified in SAPs.

### *Field Blanks*

Field blanks consist of empty, clean sample containers to be opened in the field and filled with reagent grade water prior to collection of a field sample. Upon collection of the sample, the field blank container is sealed and carried through the same handling, shipping, and analytical procedures as the field sample. Since the frequency of field blanks is project-specific, field blanks will be specified in the SAP. Field blanks may also be collected as needed based on field conditions (i.e., heavy exhaust from a drill rig, etc.).

### **Laboratory Quality Control**

Laboratory analyses will be conducted in accordance with the appropriate analytical methods. Internal laboratory quality control checks will include:

- surrogate spikes for the respective methods;
- method blank (reagent blank) that is carried through the same analytical process as native samples;
- matrix spike/matrix spike duplicates with known concentration in accordance with the laboratory SOPs;
- laboratory control samples/laboratory control sample duplicates that are spiked in accordance with analytical method and laboratory SOPs for each respective method of analysis.

The Laboratory will document continuing calibration check standards, Laboratory Control Samples, surrogates, matrix spike and matrix spike duplicate recoveries, and relative percent differences (RPDs) on statistical control charts.

The laboratory will address all data outliers and add comments in the laboratory database regarding the effect the outlier may have on the usability of the data. If the QC data indicates a systematic problem that makes the data unusable, corrective action will be implemented to resolve the problem and any affected data will be re-analyzed to obtain usable data for reporting.

In order to maintain accreditation the laboratory will participate in a Proficiency Testing program on a semiannual basis. The laboratory will analyze blind samples provided by a 3<sup>rd</sup> party vendor and must receive acceptable results on two of the most recent 3 Proficiency Testing Studies. The laboratory will report the results to the State of Utah Environmental Laboratory Certification Program office. Corrective Action Investigations will be performed for analytes that do not pass the study criteria.

### **B6 – Instrument/Equipment Testing, Inspection and Maintenance**

Instruments and Equipment will be tested, inspected and maintained as required by the manufacturer for optimal performance. Information about the actions taken and the status of the instrument and Equipment will be recorded in a logbook that is traceable to the specific instrument or Equipment. In the case where a problem is identified, the instrument or Equipment will be taken out of service until

the problem is resolved. The actions taken to resolve the problem and the outcome those actions will also be recorded in the logbook.

Balances –The calibration of Analytical balances will be verified daily or before each use and will be calibrated by a qualified Metrologist annually. The daily verification will be conducted using two calibrated weights that bracket the expected balance use range. Balance calibrations checks will be documented on logsheets.

Refrigerators/Freezers - All refrigerator and freezer temperatures will be monitored. Thermometers used (either continuous or minimum/maximum) for measurement of refrigerator and freezer temperatures will be calibrated at a frequency defined by the manufacturer.

Water Supply System - The laboratory will maintain a water supply system which is capable of furnishing reagent water that is free from target analytes or interfering elements. Such water may be generated from a system that uses deionization, distillation or some combination thereof and may incorporate filtration through carbon filters and/or particle filtration. The water system is considered adequate when reagent blank quality control samples show no positive detections for target analytes or interfering elements.

## **B7 – Instrument/Equipment Calibration and Frequency**

Calibration at a specified Frequency for Instruments and Equipment will be performed as required by the manufacturer or per the analytical methodology in use. Documentation of the calibration will be maintained in a logbook or via the raw data. Acceptance of the calibration will be verified prior to proceeding with testing.

All laboratory instruments will be calibrated with the appropriate standard solution. All reported analytes are to be bracketed by an established calibration curve. Because standard methods allow the lowest standard to be up to ten times the concentration of the MDL, any positive values below this low-level standard and above the project PQL would be classified as estimated. To avoid quantifications of data based on this requirement, the contract laboratory is required to analyze an additional low standard at or near the project PQL. Analytical guidelines and manufacturer specifications determine the frequency of laboratory instrument calibration necessary. All batches of samples analyzed will be bracketed by appropriate calibration verification standards. Corrective actions will be taken if the calibration checks do not meet established criteria.

## **B8 – Inspection/Acceptance of Supplies and Consumables**

Upon receipt of Supplies and consumables the items will be inspected to ensure that they are of the type and quality required by the methodology in use. Items received that do not meet the criteria established will be segregated to prevent inadvertent use.

For Analytical Standards, a Certificate of Analysis that is traceable to a NIST standard will be maintained on file as part of the quality records for the testing activities.

All standards and standard solutions will be catalogued to identify the supplier, lot number, purity/concentration, receipt/preparation date, preparer's name, method of preparation, expiration date, and any other pertinent information. Stock and working standard solutions will be validated before use and checked regularly for signs of deterioration. Standard solutions will be properly stored and handled, and all containers will be labeled to identify the chemical(s), concentration, solvent, expiration date, initials of preparer, and date of preparation. Reagents will be examined for purity by subjecting an aliquot or subsample to the analytical method in which it will be used. The contract laboratory will not use a standard or reagent if its expiration date has passed. Expiration date extension is allowed if it can be documented that the quality is still acceptable for the intended use. Complete documentation will be maintained for all standards and reagents used

### **B9 – Non-Direct Measurements**

Because many of the activities at the Bacchus and Promontory facilities have taken place for many years there is a wealth of historical information available. When this type of information is used to establish the actions taken, the information will be included in a SAP or a report as part of the quality record.

### **B10 – Data Management**

All analytical data produced by Laboratory and the field operations will be stored at each data producer's location.

Data transfer and communications must ensure that only validated data are stored in the project database. The transfer of data from generation, through validation, database entry, and final delivery to the Division can be summarized as follows:

- All field data will be maintained on file.
- The laboratory generates laboratory validated data and sends the reports to the PM.
- The PM reviews laboratory validated data to ensure it complies with project objectives.
- The PM coordinates third party validation of a percentage of the laboratory-validated data.
- The report from the third party validators are maintained in the project database.

The PM forwards copies of validated data as required in the permit.

### **Validation of Laboratory Data**

The Laboratory will provide a QC review of their respective data in accordance with the relevant laboratory QAP. The laboratory will enter validated data into the laboratory information management system.

The PM may request third party validation of a percentage of the data. The percentage will be dependent on the DQOs specified in the SAPs.

### **Validation of Field-Generated Data**

All field generated data will be validated by the PM prior to incorporation into the project database. The PM will validate data generated by the field instrumentation in accordance with instructions supplied with the instruments.

### **Use and Storage of Data**

Electronic data and documents shall be backed up to avoid loss. Retrieval of project documents is limited to project personnel who have been granted access to the appropriate electronic files. Sensitive or final electronic documents may be password protected to prevent unauthorized access or inadvertent changes. At project closure, these electronic documents will be copied and electronically stored on a disc or CD. When required an archived hardcopy will be maintained on file.

## **C – Assessment and Oversight**

### **C1 – Assessments and Response Actions**

To provide data having quality measures consistent with the project data quality objectives, the data shall be reviewed against established criteria for precision, accuracy, representativeness, completeness, and comparability. Limits are outlined in this QAPP and the individual SAP. Any data failing to meet the stated limits will be indicated by including data qualifiers on all affected data.

To meet SAP requirements for data quality, periodic assessments may be conducted to assure adherence to SOP requirements for field sampling, sample custody, equipment operation and calibration, laboratory sample analysis, and data reporting. Further, the PM will assess the quality of data generated once sampling and analysis of each project has been accomplished to assure that all data are scientifically valid and of known and documented quality as specified in the project SAP.

If any information found during data assessments calls into question the usability of the data, the PM will investigate the impact and corrective action will be taken to address any concerns. Corrective action may include the need to re-sample and/or re-analyze samples to obtain usable data.



The assessment process is also intended to ensure that there is an acceptable level of confidence in the decisions that are made from the data. Data that fail to meet the QC criteria may still be used for informational purposes, but will be flagged to indicate that the data has limited usability in meeting project objectives.

Data assessments will be conducted by the PM after each sampling event to assure that the QAPP, SOPs, and SAPs have been properly implemented. The PM will ensure that corrective actions are executed for any nonconformance.

Audits may be conducted as a means to determine compliance with this QAPP and SAPs. Specifically, audits may be conducted for both field and laboratory operations to assess performance to project requirements. Several factors will be taken into consideration for determining the scope and frequency for audits as follows:

1. Complexity of the activity;
2. Duration and scope of activity;
3. Degree of QC specified in the SAP;
4. Criteria to achieve quality assurance objectives;
5. Requirements for deliverables;
6. Participation of contractors;
7. Criticality of data collection; and
8. Potential for or frequency of nonconformance.

Addressing Nonconformance: The PM has the authority to stop all or part of the project activities if a nonconformance occurs and the authority to assure appropriate development and implementation of the required corrective actions.

Documentation: All auditing processes and results shall be documented.

## **C2 – Reports to Management**

The PM will keep Environmental Services management apprised project performance assessments and corrective actions. This will be communicated verbally in project progress meetings.

## D – Data Validation and Usability

### D1 – Data Review, Verification and Validation

#### Laboratory Data Reduction and Review

Data reduction is the process of transforming raw data measurements obtained during analysis to final reported data. This usually involves various calculations, application of dilution or preparation factors, as well as the use of rounding data values to the appropriate number of significant figures. Reduction of laboratory analytical data will be completed in accordance with the laboratory's quality assurance program and standard operating procedures.

The laboratory will perform the in-house analytical data reduction and QA review under the direction of the laboratory manager or designee. The laboratory is responsible for assessing data quality and indicating in the analytical reports any problems with the data that may affect usability. Any QC outlier will be addressed and a comment in the laboratory database will be made to state any affect the outlier may have had on the usability of the data. The laboratory will take corrective action were appropriate to ensure data generated meets method and project objectives. Data reduction, QA review, and reporting by the laboratory may include the any number of the following QC tasks:

1. The data reviewer will check that preliminary data produced by the analyst are processed and reviewed for attainment of quality control criteria as outlined in the laboratory QAP.
2. The data reviewer will check all manually entered sample data for entry errors and will check for transfer errors for all data electronically uploaded from the instrument output into the software packages used for calculations and generation of report forms and will decide whether any sample re-analysis is required.
3. The data reviewer will review initial and continuing calibration data, and calculation of response factors, surrogate recoveries, matrix spike/matrix spike duplicate recoveries, internal standard recoveries, laboratory control sample recoveries, sample results, and other relevant QC measures.
4. Upon acceptance of the preliminary reports by the laboratory data reviewer, the Laboratory QA Officer will review and approve the data packages prior to report submittal to the PM.

The signing of the Certified Analytical Data Report by the QA Officer indicates that the QC review tasks have been accomplished.

### Laboratory Data Package Delivery Requirements

Data deliverables will be provided in a tiered approach as indicated in the SAPs for the individual projects. The tiers, ranging from the simplest data reporting level to the more complex deliverable, are described below:

Certificate of Analysis: A certified report listing all analytical and preparation methods used, sampling dates/times, EQLs, MDLs, dilutions, analysis dates/times, analyst, and results with units of measure, dry weight reporting. Also attached will be any sample receiving documents including Chain-of-custody forms. The final report will include comments indicating any problems with sample receipt, data analysis, or quality control issues that may affect the usability of the data, including explanation of what qualified and flagged data is acceptable for use.

Certificate of Analysis with Quality Control Summary: the next level of complexity in data deliverables would be to include with the Certificate of Analysis a Quality Control Summary report. This report shows the results analysis batch quality control samples, such as blanks, laboratory control samples, matrix spikes, duplicates, initial and continuing calibration verification standards and any other method specific quality control samples. The report will indicate the expected range of acceptability for the quality control samples and flag any data that fall outside of acceptance limits. Where outlier data exists, a comment by the laboratory as to the effect on the usability of the data will be included in the analytical report.

Additional Data on File : The laboratory will maintain on file a full record of the analytical testing and include the following types of information:

1. Calibration/Standardization plots and equations.
2. Initial and continuing calibration verification summary sheets with results of true values compared to found values.
3. Copies of laboratory notebook pages showing data not otherwise recorded and calculations.
4. Digestion and preparation logs
5. Chromatograms
6. Enhanced or background subtracted mass spectra.
7. ICP interference check sample summary.
8. Internal standard area (or recovery) and retention time summary information.
9. Analysis data (including printer tapes, strip charts, etc.) for analysis/reanalysis, calibrations, diluted/undiluted samples, and QC samples.
10. Quantitation and integration reports.

11. Surrogate recovery information.

12. When used: Laboratory generated library standard spectra. For tentatively identified compounds provide the reference mass spectrum or spectra from the software-spectra library.

Electronic Data Deliverable: Any of the above deliverables may be provided in electronic format. The complexity of the electronic deliverable may vary as the needs of the project require.

#### Field Data Reduction and Review

The PM is responsible for recording data generated by field instruments including but not limited to PIDs, thermometers, barometers, and field analytical test kits in accordance with SOPs provided by the manufacturer or in the SAPs. Data shall be reported in a format to be provided in SAPs and shall include, at a minimum the following QC checks:

1. The PM will check that data produced by the instrument are within the calibration range of the instrumentation and other QC measures relevant to the field instruments. The degree to which the data meet DQOs will be provided in the data report.
2. The PM will check field logs and cross check field sampling locations and procedures with the field data for representativeness.
3. The PM will check all manually entered field data for entry errors and will check for transfer errors for all data electronically uploaded from an instrument output where appropriate.

## **D2 – Verification and Validation Methods**

#### Laboratory Data Validation

The first level of review will be conducted by the Laboratory. Laboratories have the initial responsibility for the correctness and completeness of the data they generate. The laboratory data reviewer will evaluate the quality of the analytical data based on an established set of laboratory guidelines (laboratory QAP and SOPs). This person will review the data deliverables to confirm at a minimum, the following:

1. Sample preparation information is correct and complete;
2. Analysis information is correct and complete;
3. The appropriate SOPs have been followed;
4. Analytical results are correct and complete;

5. QC sample results are within established control limits and if not, why data is useable;
6. Blank results are within appropriate QC limits;
7. Analytical results for QC sample spikes, sample duplicates, initial and continuing calibration verifications of standards and blanks, standard procedural blanks, and laboratory control samples are correct and complete;
8. Tabulation of reporting limits related to the sample is correct and complete; and
9. Documentation is complete (all anomalies in the preparation and analysis have been documented; holding times are documented).

The second level of review will include data validation conducted on a minimum of ten percent of the certificates of analysis by a third party. The sample-specific requirement review conducted by the third party validator shall include the following:

- 1) Blanks Analyses
- 2) Organic Analyses
  - a) Holding Times
  - b) Surrogate Spike Results
  - b) Matrix Spike/Matrix Spike Duplicate (MS/MSD) Sample Analysis
  - c) When required: Tentatively Identified Compound Identification
  - d) Field Duplicate Agreement
  - e) Comparison of EQLs and MDLs with project DQOs (RSL, MCL etc.)
- 3) Metals and Inorganic Analyses
  - a) Holding Times
  - b) Duplicate Sample Analysis
  - c) Matrix Spike Sample Analysis
  - d) Matrix spike duplicate or laboratory duplicate precision
  - g) Field Duplicate Agreement
  - e) Comparison of EQLs and MDLs with project DQOs (RSL, MCL etc.)

The data package delivery requirements as specified in this QAPP and SAPs will be reviewed for completeness. Data determined to be outside acceptance criteria, using professional judgement, and any conclusions reached concerning usability of the suspect data will be described in the third party data validation reports.

#### Field Data Validation

The purpose of the validation process is to evaluate the usability of field data that are collected or documented in accordance with specified protocols outlined in the SAPs. Field data will be reviewed for data usability and adherence the project objectives outlined in the SAPs and this QAPP

#### **D3 – Reconciliation with User Requirements**

Once the data verification and validation procedures have been completed, the PM will evaluate the results to determine if project DQOs have been met for field operations and laboratory analyses, respectively. The calculations specified in other sections of this QAPP and in SAPs will be used to determine if numeric acceptance criteria have been met. Data, which do not meet the requirements for their intended use, will be flagged accordingly and the flags entered into the project database, so that all data reports used for decision making are clearly noted

**ATK LAUNCH SYSTEMS (ATK) PROMONTORY  
FACILITY  
POST-CLOSURE PERMIT**

**GROUNDWATER SAMPLING AND ANALYSIS PLAN**

Draft

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## FIGURES

Figure 1      Example of Chain of Custody Form

## TABLES

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Table 2      Groundwater Monitoring Wells Completed in Unconsolidated Sediments

# ATK LAUNCH SYSTEMS GROUND WATER SAMPLING AND ANALYSIS PLAN FOR POST-CLOSURE PERMIT MONITORING

## 1.0 PURPOSE AND SCOPE

ATK Launch Systems (ATK) has developed this plan to satisfy the requirements for a ground water sampling and analysis plan as referenced in R315-264-97 of the Utah Administrative Code and this Permit.

The plan specifically addresses the sampling of ground water monitoring wells at ATK Launch systems Promontory, Utah-based Operations. The location, number, and description of each well have been submitted previously to the Utah DWMRC. The plan addresses all procedures for taking ground water samples, shipping the samples for analysis, and methods for analyzing samples.

The goal of this plan is to collect groundwater samples that are representative of in-situ groundwater conditions and to minimize changes in groundwater chemistry during sample collection and handling. DNAPL's are not known to be present in any screened interval of any well. If DNAPL's are discovered to be present in a well, this document is not sufficient, and protocol for sampling will be developed prior to sample collection.

## 2.0 QUALITY OBJECTIVES AND CRITERIA FOR MEASUREMENT DATA

This section presents the DQOs for the project and the performance criteria necessary to meet these DQOs. Included are discussions of the project DQOs, quantitative DQOs (precision, accuracy, and completeness), and qualitative DQOs (comparability and representativeness). The overall QC objective is to generate data that are of known, documented, and defensible quality.

### 2.1 DATA QUALITY OBJECTIVES

DQOs are statements that specify the quantity and quality of the data required to support project decisions. DQOs were developed for this project using the seven-step process listed in *Data Quality Objectives Process for Hazardous Waste Site Investigations* (U.S. EPA, 2000). The QC procedures as well as the associated sampling procedures for this project will be focused on achieving these DQOs in a timely, cost-effective, and safe manner. Deviations from the DQOs will require defining the cause or causes for noncompliance and will initiate the process of determining whether additional sampling and analyses will be required to attain project goals.

#### 2.1.1 Statement of Problem

Groundwater monitoring at the ATK facility has shown that, due to waste management practices of the past, contaminants have been released to the groundwater. Some of the contaminants have

routinely been detected at concentrations exceeding the Groundwater Protection Standard (GWPS) established in Module IV of this Permit. Pursuant to R315-264-90, and this Permit, ATK is required to establish a corrective action program when the GWPS is exceeded. Groundwater monitoring data collected in accordance with this SAP will be used for assessing the human health and ecological risk associated with the contaminated groundwater in order to determine the appropriate corrective action. Monitoring data will also be used to update groundwater flow and transport models that are used to predict the migration of contaminants and how points of exposure may be affected. Therefore, the goal of this plan is to outline the methodologies for collection of groundwater samples that are representative of in-situ groundwater conditions and to minimize changes in groundwater chemistry during sample collection and handling.

### **2.1.2 Decision Statement**

Decision statements identify the key questions that the study should address and alternative actions that may be taken, depending on the answer to the study questions. The key questions associated with groundwater sampling at the Promontory facility are:

- Where do the contaminant concentrations exceed the GWPS? and;
- Does the site contamination pose an unacceptable risk to human health and the environment?

The decision statement for this program is to determine where contaminant concentrations exceed the GWPS site-wide and what response is appropriate for those areas. The appropriate response (e.g. removal or treatment of contaminants, site management, or continued monitoring) will be based on the results of groundwater models, human health and ecological risk assessments and a corrective measures study.

### **2.1.3 Decision Inputs**

The most appropriate resolution of the decision statement will require the collection of groundwater samples and potentiometric surface data on a regular schedule. These samples will be analyzed for the constituents shown in Table 1 of this SAP. The analytical methods that will be used are also shown in the table. These data along with historic groundwater data, will be used as inputs to groundwater models and human health and ecological risk assessments. All of this information will be considered and appropriate corrective measures will be proposed in a Corrective Measures Study.

### **2.1.4 Study Boundaries**

Groundwater contamination at the facility exists in at least three separate plumes and in two different aquifers. The boundary of the study is defined by the extent of groundwater contamination and is not limited to the ATK property. The Area of Compliance is defined as all monitoring wells, piezometers and springs located within impacted aquifers and displaying

concentrations that exceed the Groundwater Protection Standard as defined in section IV.C. of Module IV.

The monitoring wells and springs that may be sampled are listed in Table 4-A of Attachment 4. Wells are selected for sampling on an annual basis. Shotgun and Pipe Springs are sampled semiannually, once in the Spring and once in the Fall. Well and spring locations are shown on Plates 1(a) and 1(b), Attachment 4.

#### **2.1.5 Decision Rule**

As stated above, groundwater monitoring at the site has shown that the GWPS has been exceeded for a number of constituents. The GWPS for constituents that have been detected at the site are listed in Table IV-1 of the Permit. Based on the requirements of R315-264-90 and this Permit, if the GWPS is exceeded then a corrective action program shall be initiated.

In accordance with Module V, Section A, ATK is currently conducting human health and ecological risk assessments, as part of the corrective action program, using the Director approved groundwater flow and contaminant transport models. The risk assessments are being conducted in accordance with the State of Utah R315-101 Cleanup Action and Risk-Based Closure Standards. The characterization and evaluation of risk is based on developing concentration terms for contaminants (generally the 95% upper confidence limit of the mean) and calculating the reasonable maximum exposure for all exposure pathways. The appropriate response action that will be taken at the site will be dependent on the results of the risk assessments.

#### **2.1.6 Tolerable Limits on Decision Errors**

Tolerable error limits assist in the development of sampling designs to ensure that the spatial variability and sampling frequency are within specified limits. However, the location, number, and frequency of sampling at the Promontory facility has been previously determined by the requirements of the Post Closure Permit and compliance monitoring downgradient of identified Solid Waste Management Units. The selection of the well locations was based on professional judgment rather than statistics. Therefore, error limits are not used to determine sampling locations or frequency. There is no need to define the “gray region” or the tolerable limits on the decision error, since these only apply to statistical designs.

In general, the steps necessary to minimize errors and produce good quality data will be incorporated into quality assurance/quality control (QA/QC) protocols in this plan.

#### **2.1.7 Selected Sampling Design**

The proposed sampling locations (monitoring wells) were drilled in areas based on best professional judgment, site history, aerial photos, and results of previous environmental investigations. A statistical design for collecting groundwater samples will not be used. The Post-Closure care period began in 1992 for the M-136 impoundments. The location of contaminant plumes have been identified based on this collection of data. In addition, due to the large number of wells that exist, plans are submitted annually for which wells will be sampled.

The selection of wells to sample is based on an evaluation of what data is the most pertinent at the time the sampling plan is generated.

## 2.2 QUANTITATIVE OBJECTIVES

Precision quantifies the repeatability of a given measurement. Precision is estimated by calculating the relative percent difference (RPD) of field duplicates, as shown in the following equation:

$$(\%) \text{RPD} = \frac{\text{Result} - \text{Duplicate Result}}{(\text{Result} + \text{Duplicate Result})/2} \times 100$$

The laboratory will review the QC samples to ensure that internal QC data lies within the limits of acceptability. Any suspect trends will be investigated and corrective actions taken. The laboratory will document the calculation for %RPD or other statistical treatment used. The results will be compared to the acceptance criteria as published in the mandated test method. Where there are no established criteria, the laboratory will determine internal criteria and document the method used to establish the limits

Accuracy refers to the percentage of a known amount of analyte recovered from a given matrix. Percent recoveries are estimated using the following equation and can be calculated for the project-specific matrix (i.e., water).

Recovery Laboratory Control Standard (LCS) and Surrogate Internal Standard

$$(\text{SIS}) (\%) = \frac{(\text{Amount Spike Recovered})}{\text{Added Spike Amount}} \times 100$$

Recovery Matrix Spike/Matrix Spike Duplicate

$$(\text{MS/MSD})(\%) = \frac{(\text{Spiked Sample Result}) - (\text{Sample Result})}{\text{Spike Added}} \times 100$$

The recovery of most spiked organic compounds is expected to fall within a range of 70 to 130%.

Completeness refers to the percentage of valid data received from actual testing done in the laboratory. Completeness is calculated as shown in the following equation. The target completeness goal for all compounds is 100%. However, where data are not complete, decisions regarding re-sampling and/or reanalysis will be made by a collaborative process involving ATK Environmental personnel, laboratory personnel, and regulatory personnel. The completeness goal for holding times will be 100%.

$$\text{Completeness \%} = \frac{\text{Number of Measurements Judged Valid}}{\text{Total Number of Measurements}} \times 100$$

## 2.3 QUALITATIVE OBJECTIVES

Comparability is the degree to which one data set can be compared to another. To ensure comparability, samples will be collected at specified intervals and in a similar manner, and will be analyzed within the required holding times by accepted and comparable methods. Comparability will be obtained through the use of standard sampling procedures and trained personnel, and through standard analytical methods used by the laboratory. Additionally, adherence to the procedures and QC approach contained in the QAPP will provide for comparable data throughout the sampling events. All data and units used in reporting for this project will be consistent with accepted conventions for environmental matrix analyses. This approach will ensure direct comparability between the results from one sampling event to the next sampling event using the methods presented in this SAP.

Representativeness is the degree to which a sample or group of samples is indicative of the population being studied. Over the course of a project, samples will be collected in a manner such that they are representative of both the chemical composition and the physical state of the sample at the time of sampling.

## 2.4 AUDITS AND REPORTING

A Performance Audit will be conducted during a sampling round at least once in a five year period. The performance audit will be used to determine the status and effectiveness of field and laboratory measurement systems.

For the laboratory, this will involve the use of PE samples with known concentrations of constituents that will be analyzed as unknowns in the laboratory. Results of the laboratory analysis will be calculated for accuracy against the known concentration and acceptance limits provided by the supplier or manufacturer.

Field performance will be evaluated using field blanks, trip blanks, field duplicates, and equipment blanks as described in Section B5 of the QAPP.

A Data Quality Audit will be conducted following the procedures specified in Section C2 of the QAPP to assess the effectiveness and documentation of the data collection and generation processes. Data-quality audits will be conducted by the DVSM at least once during a five year period.

A Technical System Audit (TSA) will be performed once each five years. A TSA is a thorough and systematic qualitative onsite audit where equipment, personnel, training, procedures, and

record keeping are examined for conformance with requirements of the QAPP. The TSA will encompass field sampling activities, data validation, and data management. All findings will be documented in writing to the OPM and communicated to the PM when the assessment is complete. A copy of the TSA report will be provided to the Division for review, together with a discussion of all proposed corrective actions and corrective actions taken as a result of the audit.

The TSA will include a field audit to check on sample collection and sample handling procedures. The field audit will include:

- A review of compliance with requirements of the QAPP and Sampling Plans
- On-site visits, which will include observation of field personnel as they perform all aspects of the sampling programs: field equipment calibration, equipment decontamination, sample collection, sample packaging, and documentation. The on-site visits will also include a review of data collection forms, COC forms, calibration procedures, etc. The auditor will also talk individually with field personnel to determine consistency of sampling procedures and adherence to the approved sampling plan.

### **3.0 SAMPLE COLLECTION**

As of March, 2012, 102 groundwater monitoring wells have been installed at the ATK-Promontory facility. The first series of wells was installed in 1985. The RCRA Groundwater Monitoring Technical Enforcement Guidance Document (TEGD) was used as a guide for the installation of monitoring wells once the document was published in 1986. Wells have been completed in both bedrock and unconsolidated sediments and from depths ranging from 25 feet to over 600 feet deep. 20 foot well screens and dedicated pumps were used in the earlier wells that were installed. More recent wells that have been installed utilize 10 foot well screens without dedicated pumps.

ATK collects groundwater samples, in accordance with the November 1992 TEGD, using the pumps described in Section 3.2.3 below or HydraSleeve, no purge groundwater samplers, as described in Section 3.3.1 below. Occasionally, bailers may be used for collecting samples from the deepest wells at the facility. In general, if the well still has an operating, dedicated pump the sample will be collected with the pump using the well purging and sampling methods described below.

In the Spring of 2006, ATK began a study to evaluate the use of the HydraSleeve, no purge sampling method. A plan to evaluate the accuracy of the collection method was submitted to the Division of Solid and Hazardous Waste (the Division) in April of 2006. The study showed that samples collected with the HydraSleeve compared very well with samples collected using the conventional method. The Division approved the use of the HydraSleeve sampler on June 20, 2008. This SAP includes the use of the HydraSleeve sampler as an option for collecting groundwater samples.

The HydraSleeve sampler will be used in all applicable wells, unless the wells have a functioning dedicated pump system.

### **3.1 WATER LEVEL MEASUREMENT**

Before sampling any ground water monitoring wells, a water level measurement will be recorded using an electronic water level indicator to the nearest 0.01 feet. The water level will be recorded in the field book before each monitoring well is sampled. The total depth of all monitoring wells that are completed in unconsolidated sediments will be measured every three years beginning in 2008 and will be recorded to the nearest 0.1 feet in the field book. The northern edge of the (inner) PVC casing shall be used as the reference point. Table 2 contains a list of all wells at the facility that were completed in unconsolidated sediments.

### **3.2 PURGING THE MONITORING WELLS**

The ground water monitoring wells will be purged before sampling begins, unless the well will be sampled using the HydraSleeve sampling method. Monitoring wells shall be purged so that stagnant waters, which are not representative of the waters in the aquifer, can be removed before sampling. The amount of water to be removed from the well will be dependant upon the ground water yield for the formation in which the well is located. Although specific purge and sample systems are described below, other methods may be employed if they meet guidelines approved by the USEPA and Utah DSHW.

#### **3.2.1 Purging High-Yield Formations**

**A.** For high-yield formations (which produce greater than 1 gpm), three casing volumes of water will be removed from the well or until the pH, temperature, and conductance has stabilized within approximately 10% over at least two measurements. A casing volume is defined as the volume of water between the water level measured and the total depth of the monitoring well. The casing volume will be calculated during each sampling period, so that a consistent volume of standing water can be removed prior to each sampling.

**B.** Low-flow Purging (consistently yields the highest level of data quality), <1 L/min (.26 gpm), Low-flow Sampling < 300 ml/min (0.3 L/min or 0.1 gpm). During purging, the water level in the well should not decrease significantly and should stabilize after purging for a few minutes. Purge the well until the pH, temperature, and conductance have stabilized within approximately 10% over at least two measurements. The pump intake will be positioned within the lower screened interval.



### **3.2.2 Purging Low Yield Formations**

For low-yield formations (which produce less than approximately 1 gpm), wells should be purged at or below their recovery rate so that migration of water in the formation above the well screen does not occur. A low purge rate also will reduce the possibility of stripping VOCs from the water, and will reduce the likelihood of mobilizing colloids in the subsurface that are immobile under natural flow conditions. Make sure that purging does not cause formation water to cascade down the sides of the well screen. At no time should a well be purged to dryness if recharge caused the formation water to cascade down the sides of the screen, as this will cause an accelerated loss of volatiles. Water should be purged from the well at a rate that does not cause recharge water to be excessively agitated until the pH, temperature and conductance has stabilized within approximately 10% over at least two measurements. The pump intake will be positioned within the lower screened interval.

### **3.2.3 Purging and Sampling Equipment**

Wells less than 250 feet deep may be purged and sampled with a variable frequency pump or a bladder pump. Wells greater than 250 feet deep may be purged and sampled using a pneumatic-operated tubing-vented piston pump or a bladder pump. Wells greater than 250 feet with a dedicated system may use a submersible pump for purging and a bladder pump for collection of volatile organic samples or a variable frequency 4" diameter Pump or a bladder pump. Wells greater than 500 feet deep may be purged using a submersible pump and sampled with a bailer or a bladder pump may be used. Variable speed low rate centrifugal pumps and bladder pumps may also be used for both purging and sampling. When dedicated equipment is not used for sampling it should be cleaned in the following manner: Wash the equipment with a non-phosphate detergent. Rinse the equipment with tap water. Rinse the equipment with reagent water. Decontamination fluids should be put in the waste water collection tank and disposed of with the collected well water. Equipment blanks will be taken on approximately 10% of all wells sampled not using dedicated equipment.

The HydraSleeve groundwater sampler can be used in wells that do not have a functioning, dedicated sampling system.

### **3.2.4 Nested Multi-Screened Well**

Wells B-2 and F-2 consist of three two inch inside-diameter well casings nested within an eight-inch diameter borehole. Each casing is screened at a different depth in the aquifer. These wells are also sampled using a HydraSleeve. If a pump is used, purging and sampling is accomplished by using a pneumatic-operated tubing-vented piston pump or a centrifugal, variable speed, low-rate pump. Each casing shall be purged of three casing volumes prior to sampling, or until parameters stabilize.

### 3.3 SAMPLING PROCEDURE FOR MONITORING WELLS

Each well will be sampled using the following procedure. These procedures will describe specifically the following steps for sampling the wells.

- (1) Each well will be purged before removing a sample unless the well will be sampled using the HydraSleeve sampling method as described below.
- (2) If purging is required, the sampling pump will be operated to produce a stream of ground water. Before taking a sample, the pH, specific conductance, and temperature will be measured using portable meters. Samples will be taken when the pH, conductance, and temperature have stabilized to within approximately 10% over at least two readings, or after three casing volumes of water have been purged. A sample from the pump will be put into an appropriate container.
- (3) For volatile organic compounds, the flow rate will be restricted to less than 100ml/minute while taking the samples. To minimize the possibility of volatilization of organic constituents, no headspace should exist in the containers of samples containing volatile organics.
- (4) The samples will be taken in the following order:
  - 1) Volatiles
  - 2) Anions
  - 3) TDS
  - 4) Metals
  - 5) Other Constituents
- (5) The number, size and type of sample containers required for the constituents that will be sampled are given in Table 1.
- (6) If samples are being split, the samples will be taken directly from the ground water monitoring well. This process will be done in order to minimize volatilization of sensitive organics.

#### 3.3.1 HydraSleeve

The HydraSleeve is a discrete interval, no-purge groundwater sampler. A representative sample is collected by the sampler when it is raised through the water column in the screened interval of the well. A new, clean HydraSleeve sampler is used each time a sample is collected by this method.

One or more HydraSleeves are weighted and placed within the screened interval of the monitoring well. Typically a dedicated pre-measured line allows for the required depth to

be achieved during each sampling event. It is typically left in the well for a period of time to allow the well to re-equilibrate following sampler deployment. To activate, the sampler is pulled up a distance equal to 1 to 2 times the sampler length. The HydraSleeve collects a sample with no drawdown and minimal agitation or displacement of the water column. Once the sampler is full, the one-way reed valve closes, which prohibits any more water from entering the sampler. An alternate approach to activating the sampler is to raise and lower it multiple times over a distance equal to the sampler length. This approach is less attractive because the raising and lowering of the sampler can result in increased agitation of the water in the well and higher turbidity levels in the sample.

The best way to remove a sample from the HydraSleeve with the least amount of aeration and agitation is with the short plastic discharge tube included with each sampler. First, squeeze the full sampler just below the tip to expel water resting above the flexible check valve. Then, push the pointed discharge tube through the outer polyethylene sleeve about 3-4 inches below the white reinforcing strips. Discharge the sampler into the desired containers (per sampling protocol). Raising and lowering the bottom of the sampler or pinching the sample sleeve just below the discharge tube will control the flow of the sampler. The sample sleeve can also be squeezed, forcing fluid up through the discharge tube, similar to squeezing a tube of toothpaste.

### **3.4 FIELD QUALITY ASSURANCE AND CONTROL PROGRAM**

The field QA/QC program is described in the Post-Closure Permit Quality Assurance Project Plan. A general description is given below.

A QA/QC officer has been appointed to oversee the Ground Water QA/QC Plan, implement all phases of the Field Quality Assurance and Control Program, and to periodically audit the laboratory's QA/QC Program. The QA/QC officer will work with the sampling staff and the laboratory's QA/QC officer to assure that the data collected from the ground water is accurate. The QA/QC officer duties include:

1. Making sure that the Ground Water Sampling Plan is followed.
2. Making sure the laboratory follows their QA/QC plan.
3. Send spiked samples periodically to the laboratory to audit the QA/QC program.

#### **3.4.1 Trip Blanks, Field Blanks and Field Duplicates**

Trip blanks, when collecting VOC's, will consist of not less than ten percent of the total of samples, and will be made of deionized water, prepared at the laboratory immediately before leaving on a sampling run. The trip blanks are then placed in a cooler which will be filled by

other samples: the trip blanks are handled in the same manner as other samples. Holding times for a trip blank begins when groundwater samples are being collected.

#### Field Blanks (field rinsate blank, decontamination blank, equipment blank)

Collect one field blank for every 10 samples collected. Decontaminate the sampling equipment for the field blank the same way you do when collecting other samples. After decontaminating the sampling device (e.g., bailer or pump), fill it with laboratory reagent grade water, then collect a sample of the reagent grade water, this is your field blank. The field blank should be analyzed for the same parameters as the samples. Field blanks are not required if you used dedicated sampling equipment (permanently left in the well) or disposable sampling equipment.

Field duplicates, consisting of not less than ten percent of the total samples, will be collected and stored with the water samples. The field duplicates are collected and handled at the same time and in the same manner as a regular sample. The results of these samples are compared against those of the appropriate regular sample.

### 3.4.2 Blind Controls and Spiking Samples

Annually, the QA/QC officers will send a spiked sample or a blind control to the laboratory to audit the laboratory's QA/QC program. A blind control and a spiked sample both are samples with a known amount of solute in a solvent. The difference between a blind control and a spiked sample is the following:

- 1) Blind Control – An unannounced spiked sample sent to the laboratory.
- 2) Spiked Sample – An announced spiked sample sent to the laboratory.

The level of contamination in either case is not divulged to the laboratory.

The QA/QC officer will review the spike or blind control recovery. If the spike or blind control recovery is out of line with the laboratory's surrogate spike and matrix spike recoveries, the laboratory's QA/QC officer will be contacted to resolve the problem.

### 3.4.3 Sample Handling

Sampling equipment and techniques have been designed so that the ground water sample is not contaminated or altered. A critical part of obtaining samples is proper sample handling. All of these procedures will be followed for handling ground water samples.

All samples requiring refrigeration will be stored in a secured refrigerator or ice chest with ice. Sample preservation requirements and maximum holding times for the constituents that will be collected are shown in Table 1. All samples will be labeled and accompanied by a laboratory request and chain of custody sheets.

### **3.4.4 Labeling Samples**

All sample containers will be labeled with the following information:

- 1) Sampling date and time
- 2) Sample number
- 3) Name of person taking samples
- 4) Parameters to be analyzed in sample
- 5) Location of sampling point
- 6) Preservative added (if applicable)

### **3.4.5 Field Book**

During each sampling period, the person sampling the ground water wells will keep a field book into which all relevant information regarding sampling will be recorded. The data must be entered in the book using permanent ink. The following information will be entered into the field book as applicable to the sampling method:

- 1) Signature and date of person(s) conducting the sampling.
- 2) General weather conditions.
- 3) Date and time each well is sampled.
- 4) Sample number and location of sample (i.e., well number).
- 5) Static water level in well.
- 6) Volume of a casing of well (if applicable).
- 7) Well depth
- 8) Flow rate, and purge start and stop times.
- 9) Well purging procedure and equipment
- 10) Well yield (high or low) and well recovery after purging (slow, fast)
- 11) PH, specific conductance, and temperature measured during stabilization of well.
- 12) Sample withdrawal procedure and equipment
- 13) Internal temperature of field and shipping containers
- 14) Conductance and pH meter calibration date.

- 15) Any irregularities in the sampling procedures or in the conditions of the wells.
- 16) Any other information the sampler deems necessary or important during sampling.

### **3.4.6 Chain-of-Custody Control Procedures**

All samples will be controlled by chain-of-custody procedures. All samples shall be accompanied by a chain-of-custody form. This form must be completely filled out, signed, and dated by the sampler. An example of the form is found on Figure 1.

The containers will be placed in a lockable cold storage box, or refrigerator. This box will be in the possession of the person charged with the custody of the samples or the box will be locked and placed in a secure place. Under no circumstances will the box with the samples be left unlocked or unattended. A copy of all the Chain-of-Custody forms will be reviewed for accuracy and filed by the QA/QC officer.

### **3.4.7 Field Equipment Calibration Procedure**

The pH and conductivity meters will be calibrated with a standardized solution in accordance with the manufacturer's specification each day they are used when collecting samples. Record of these calibrations will be kept in the Field Log Book.

## **3.5 SAMPLE COLLECTION SCHEDULE**

The ground water monitoring wells will be sampled annually in accordance with Module IV. Shotgun and Pipe Springs are sampled semiannually, once in the Spring and once in the Fall.

## **4.0 ANALYSIS OF GROUND WATER SAMPLES**

Wells will be sampled for constituents specified in the post-closure permit. Samples will also be analyzed for the field water quality parameters pH, temperature, and conductance as applicable.

### **4.1 ANALYTICAL LABORATORY**

All samples will be analyzed by a state certified laboratory using EPA or State approved analytical methods. If there is not an established EPA or State approved analytical method, the Utah Director of DWMRC will be notified for approval of the proposed analytical method.

If the laboratory is not State certified to do a specific analysis, the laboratory will subcontract a State certified laboratory to do the analysis. Table 1, contains a listing of analytes, methods, containers, and holding times.

## **5.0 REPORTS**

Reports submitted annually to the Utah DEQ will include raw analytical data and analysis of data as described in Section D of the QAPP.

### **5.1 PRESENTATION OF ANALYTICAL RESULTS**

The analytical results received from the laboratory will be placed on a computer for easy data manipulation and presented in the following manner:

#### **5.1.1 Listing of Data**

All the collected monitoring data will be presented in a list. This list will be presented according to monitoring well and will include all of the data produced from sampling the monitoring well. The list will include the following data:

- Ground water contaminant constituents
- Monitoring well number
- Date sample was taken
- Concentration of constituents
- Units
- Laboratory detection limits (including the method detection limit and estimated quantitation limit)

FIGURE 1  
CHAIN OF CUSTODY

Page \_\_\_\_ of \_\_\_\_

ATK Launch Systems, Promontory Utah

Collected by:	Project:
Contact:	Collection Location:
Telephone:	Work Order:

Turn Around Time: \_\_\_\_\_

SAMPLE NUMBER	LAB	DATE SAMPLED	TIME SAMPLED	NUMBER OF BOTTLES	ANALYSIS REQUESTED

Relinquished by:	Received by:	Date/Time



**TABLE 1. SAMPLING AND ANALYTICAL METHODS REQUIREMENTS**

<b>Parameter</b>	<b>Matrix</b>	<b>Analytical Method</b>	<b>Containers per sample (number, size, and type)</b>	<b>Preservation Requirements (temperature, chemical)</b>	<b>Maximum Holding Time (to extraction)</b>	<b>Lab Holding Time (after extraction)</b>
Volatile Organic Compounds	Water	USEPA Method 8260B - ATK SOP 401	3-40 ml glassTeflon cap	Cool 4° C HCl to pH<2	14 Days	40 days
Perchlorate	Water	USEPA Method 314- ATK SOP 314	250 ml nalgene	Cool 4° C	28 days	28 days
Metals: As, Ba, Be, Co, Cr, Mo	Water	USEPA Method 6010B-ATK SOP 364 USEPA Method 7471A-ATK SOP 373	500 ml nalgene	Cool 4° C HNO <sub>3</sub> to pH<2	28 days (Hg); 6 months (other)	40 days
RDX	Water					
HMX	Water					
Nitrate	Water					

**Table 2 – Groundwater Monitoring Wells Completed in  
Unconsolidated Material**

<b>Well</b>	<b>Total Depth</b>	<b>Well</b>	<b>Total Depth</b>	<b>Well</b>	<b>Total Depth</b>
A-7	242.00	G-1	97.70	LF-2	154.75
B-5	178.20	G-2	98.60	LF-3	153.80
B-6	127.00	G-3	26.00	M-508-1	203.00
B-7	97.00	G-4	76.35	M-508-2	199.40
B-8	112.95	H-1	47.00	M-508-3	202.29
C-7	108.30	H-2	58.30	M-508-4	200.68
E-1	126.25	H-3	81.30	M-508-B1	182.00
E-2	120.00	H-5	48.30	P-1	257.00
E-4	132.90	H-6	53.58	P-2	178.48
E-5	122.00	H-8	143.70	P-5	127.00
E-8	228.00	H-9	12.85	P-6	93.25
E-9	234.00	H-10	30.0	P-7	90.58
F-1	107.00	J-1	145.00	P-8	179.20
F-2A	151.75	J-3	147.70	P-9	193.00
F-2B	217.20	J-7	146.25	P-10	105.00
F-2C	319.15	J-8	166.35		
F-3	108.00	LF-1	136.95		

**TABLE 4-A**  
**Groundwater Monitoring System**

MONITORING WELL/ PIEZOMETER	WELL COLLAR ELEVATION (FT. MSL)	SCREENED INTERVAL (FT. MSL)	
		TOP	BOTTOM
A1	4625.03	4292.50	4272.50
A2	4730.49	4552.90	4532.90
A3	4702.71	4558.20	4538.20
A4	4643.22	4282.70	4262.70
A5	4618.54	4289.00	4269.00
A6	4482.05	4277.50	4257.50
A7	4471.15	4246.60	4226.60
A8	4486.60	4290.10	4270.10
A9	4509.80	4291.30	4271.30
A10 <sup>1</sup>	4772.43	4544.90	4524.90
B1	4596.22	4288.70	4268.70
B2A	4499.31	4284.80	4274.80
B2B	"	4270.80	4260.80
B2C	"	4246.80	4236.80
B3	4610.75	4290.20	4270.20
B4	4507.29	4287.80	4267.80
B5	4429.09	4270.60	4250.60
B6	4367.02	4259.50	4239.50
B7	4340.16	4257.60	4237.60
B8	4363.72	4271.20	4251.20
B9	4697.79	4552.30	4542.30
B10	4649.06	4526.10	4516.10
C1	4523.73	4280.00	4260.00
C2	4584.56	4270.30	4250.30
C3	4621.62	4268.10	4248.10
C4	4714.68	4312.70	4292.70
C5	4448.47	4296.90	4276.90
C6 <sup>1</sup>	4527.02	4273.50	4253.50
C7	4379.73	4291.80	4271.80
C8 <sup>1</sup>	4414.12	4300.60	4280.60
D1 <sup>2</sup>	4696.93	4554.40	4534.40
D2 <sup>2</sup>	4605.08	4277.60	4257.60
D3 <sup>2</sup>	4553.87	4276.40	4256.40
D4 <sup>2</sup>	4522.35	4259.80	4239.80
D5 <sup>2</sup>	4524.26	4246.70	4226.70
D6 <sup>2</sup>	4564.16	4271.70	4251.70
D7 <sup>2</sup>	4367.11		
E1	4381.06	4272.80	4252.80
E2	4372.32	4269.60	4249.60
E3	4375.68	4269.30	4249.30
E4	4360.16	4247.60	4227.60
E5	4344.55	4242.90	4222.90
E6	4332.01	4262.30	4242.30
E7	4367.11	4146.80	4136.80
E8	4462.06	4253.00	4233.00
E9	4495.38	4283.20	4263.20
E10	4761.21	4285.10	4265.10

**TABLE 4-A**  
**Groundwater Monitoring System**

MONITORING WELL/ PIEZOMETER	WELL COLLAR ELEVATION (FT. MSL)	SCREENED INTERVAL (FT. MSL)	
		TOP	BOTTOM
F1	4378.19	4292.00	4272.00
F2A	4382.35	4239.80	4229.80
F2B	"	4175.70	4165.70
F2C	"	4070.30	4060.30
F3	4362.79	4274.70	4254.70
F4	4437.14	4271.70	4251.70
F5	4367.23	4067.10	4047.10
G1	4352.31	4265.81	4255.81
G2	4324.63	4235.63	4225.63
G3	4275.89	4258.89	4248.89
G4	4330.94	4262.14	4252.14
G5	4391.22	4259.22	4249.22
G6	4325.83	4258.83	4248.83
G7	4386.35	4246.35	4236.35
G8	4477.81	4236.81	4226.81
H1	4294.74	4257.74	4246.74
H2	4306.83	4261.83	4251.83
H3	4327.98	4252.98	4242.98
H4	4354.66	4262.66	4252.66
H5	4300.15	4262.15	4252.15
H6	4308.68	4268.68	4258.68
H7	4380.62	4260.62	4250.62
H8	4386.17	4246.17	4236.17
H9	4259.27	4244.27	4234.27
H10	4246.27	4226.27	4216.27
J1	4455.00	4316.00	4306.00
J2	4658.58	4303.58	4293.58
J3	4590.71	4451.71	4441.71
J4	4560.17	4251.17	4241.17
J5	4308.65	4240.65	4230.65
J6	4321.70	4232.70	4222.70
J7	4448.96	4313.96	4303.96
J8	4451.53	4296.53	4286.53
J9	4819.73	4249.73	4239.73
LF1	4421.71	4303.11	4283.11
LF2	4434.77	4303.27	4283.27
LF3	4419.92	4296.72	4276.72
LF4	4453.07	4303.07	4283.07
M508-1	4506.68	4326.68	4306.68
M508-2	4514.41	4334.41	4314.41
M508-3	4506.37	4326.37	4306.37
M508-4	4511.99	4331.99	4311.99
M508-B1	4512.08	approx. 4340	approx. 4320
M39-B1	4631.88	approx. 4412	approx. 4392
M114-B1	4560.14	approx. 4395	approx. 4375
M636-B1	4656.91	approx. 4572	approx. 4552
P1	4549.32	4319.32	4289.32
P2	4539.21	4389.71	4359.71

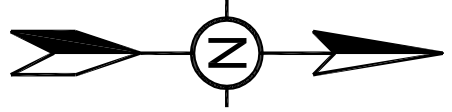
**TABLE 4-A**  
**Groundwater Monitoring System**

MONITORING WELL/ PIEZOMETER	WELL COLLAR ELEVATION (FT. MSL)	SCREENED INTERVAL (FT. MSL)	
		TOP	BOTTOM
P3	4498.30		
P5	4498.17	4390.23	4370.23
P6	4540.93	4470.20	4450.20
P7	4529.52	4461.46	4441.46
P8	4517.80	4363.16	4338.16
P9	4530.70	4365.43	4335.43
P-10	4538.40	4453.40	4433.40
T1 <sup>2</sup>	4365.83	4263.83	4243.83
T2 <sup>2</sup>	4591.62	4282.62	4262.62
X4	4861.35	4253.80	4233.80
X5	4491.31	4231.31	4211.31
BC1 <sup>3</sup>	4235.43	4180.40	4170.40
BC2 <sup>3</sup>	4298.37	4263.40	4253.40
BC3 <sup>3</sup>	4287.33	4262.30	4252.30
BC4 <sup>3</sup>	4271.86	4204.80	4194.80
BC5 <sup>3</sup>	4253.96	4223.90	4213.90
BC6 <sup>3</sup>	4271.94	4242.90	4232.90
Shotgun Spring	approx. elevation 4260 ft.	n.a.	n.a.
Pipe Spring	approx. elevation 4260 ft.	n.a.	n.a.
Fish Spring	approx. elevation 4250 ft.	n.a.	n.a.
Horse Spring A	approx. elevation 4250 ft.	n.a.	n.a.
Horse Spring B	approx. elevation 4260 ft.	n.a.	n.a.
Fork Spring	approx. elevation 4250 ft.	n.a.	n.a.
Horse Pasture Spring	approx. elevation 4250 ft.	n.a.	n.a.
Connor Spring	approx. elevation 4250 ft.	n.a.	n.a.

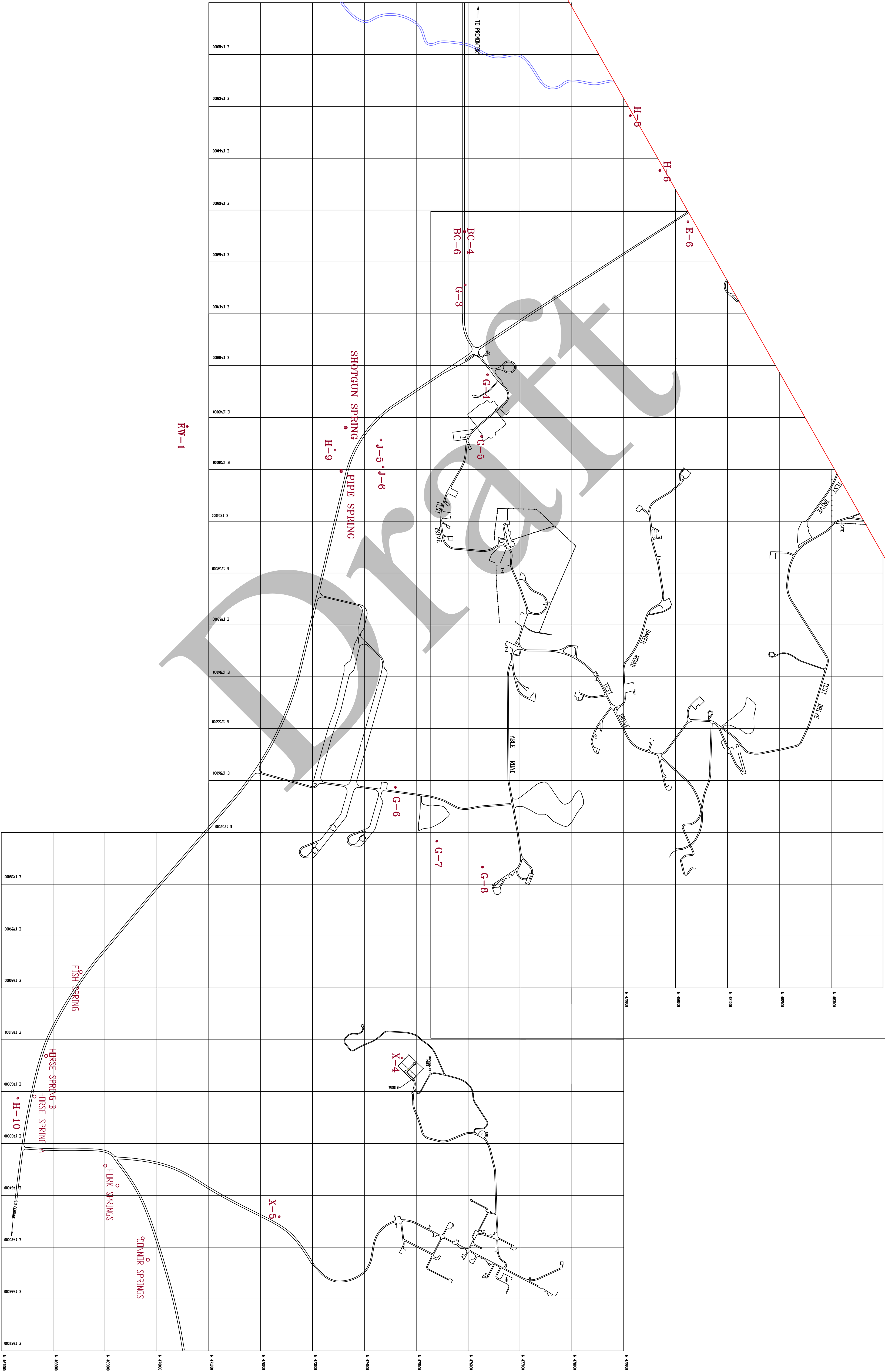
1 background wells

2 not constructed in accordance with the EPA Technical Enforcement Guidance Document

3 piezometer

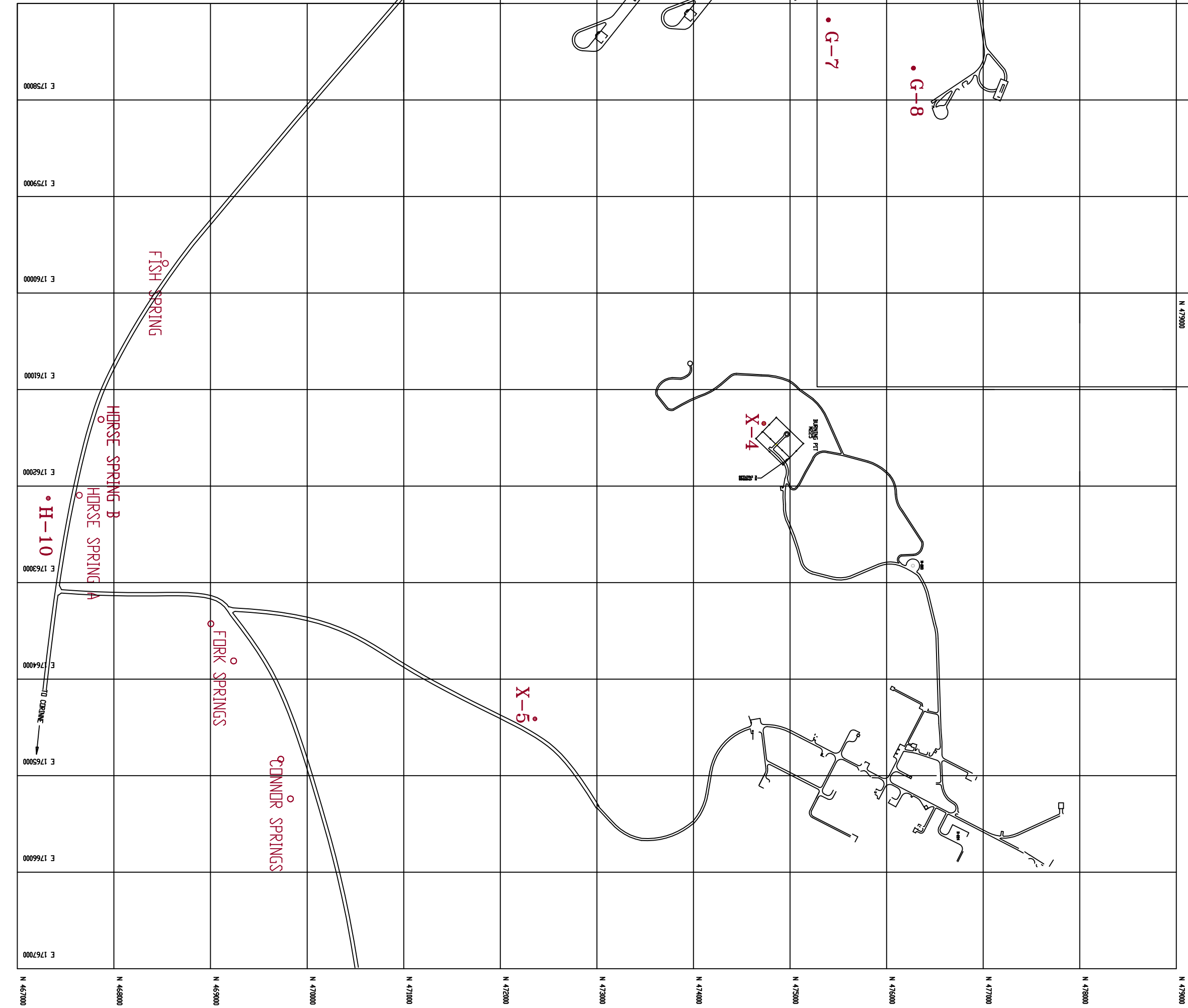
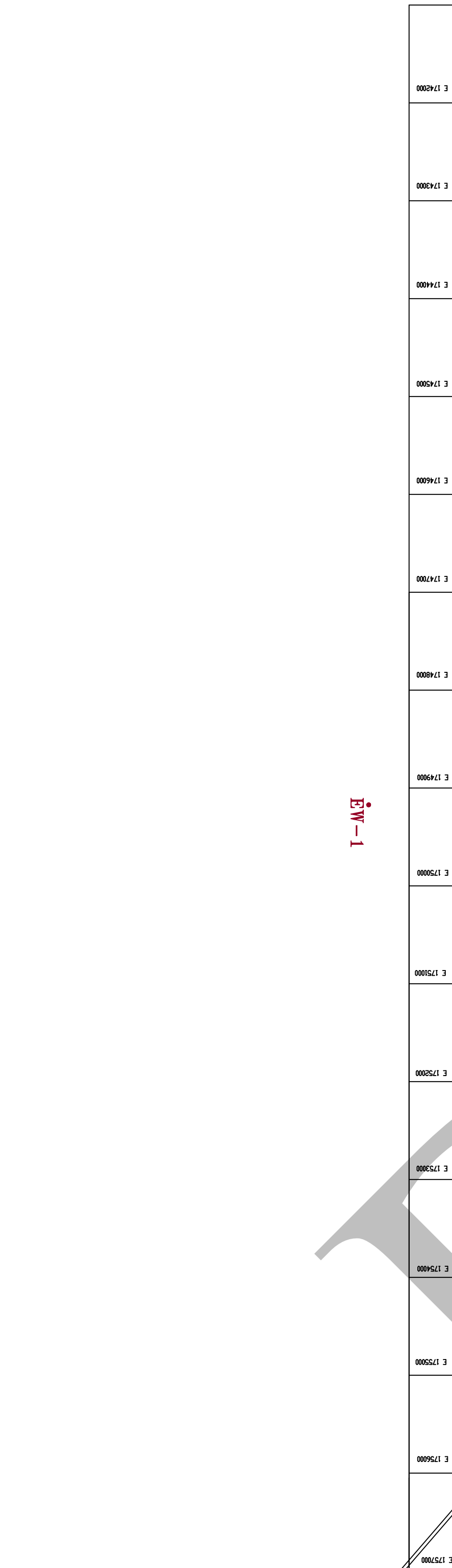
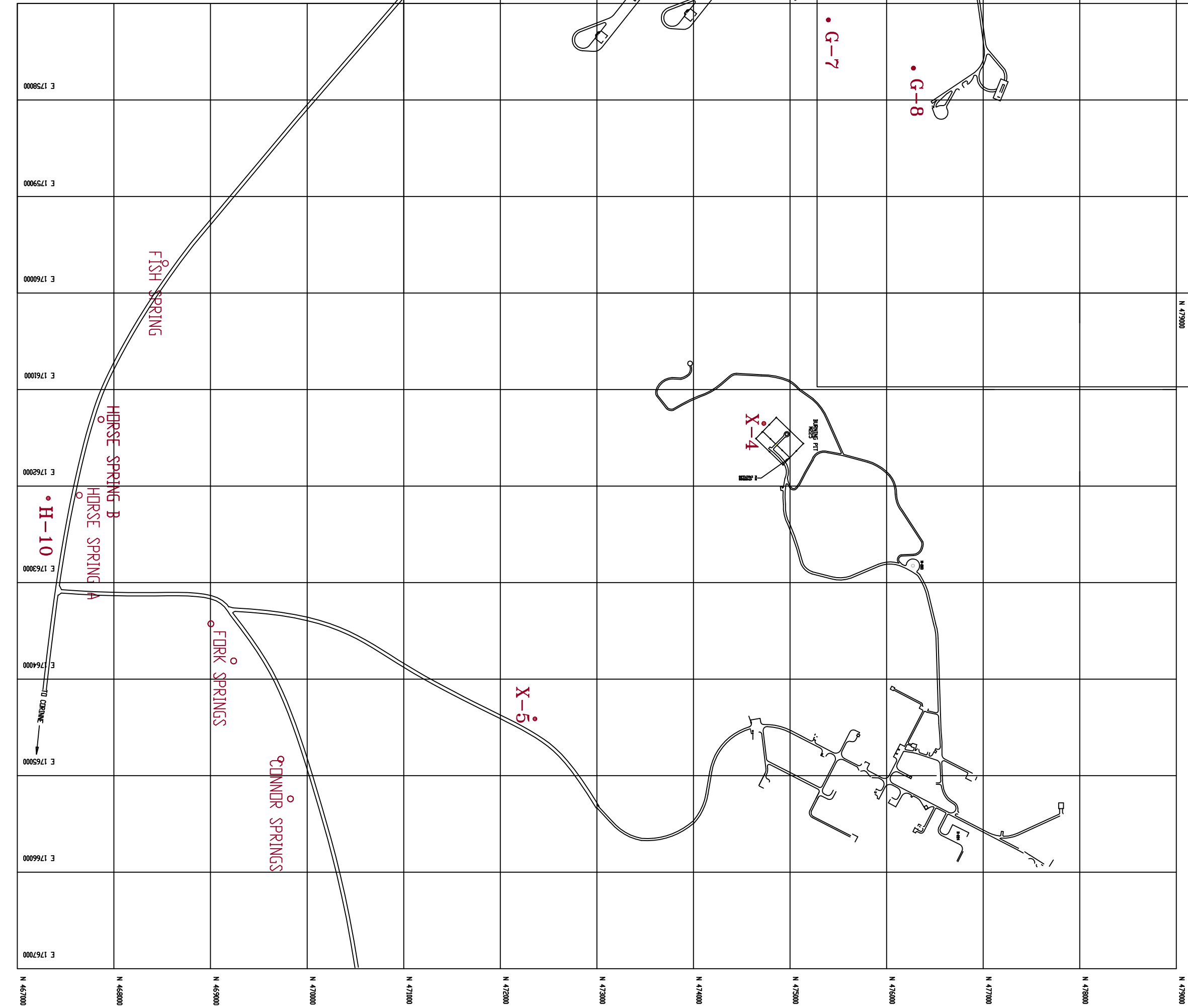
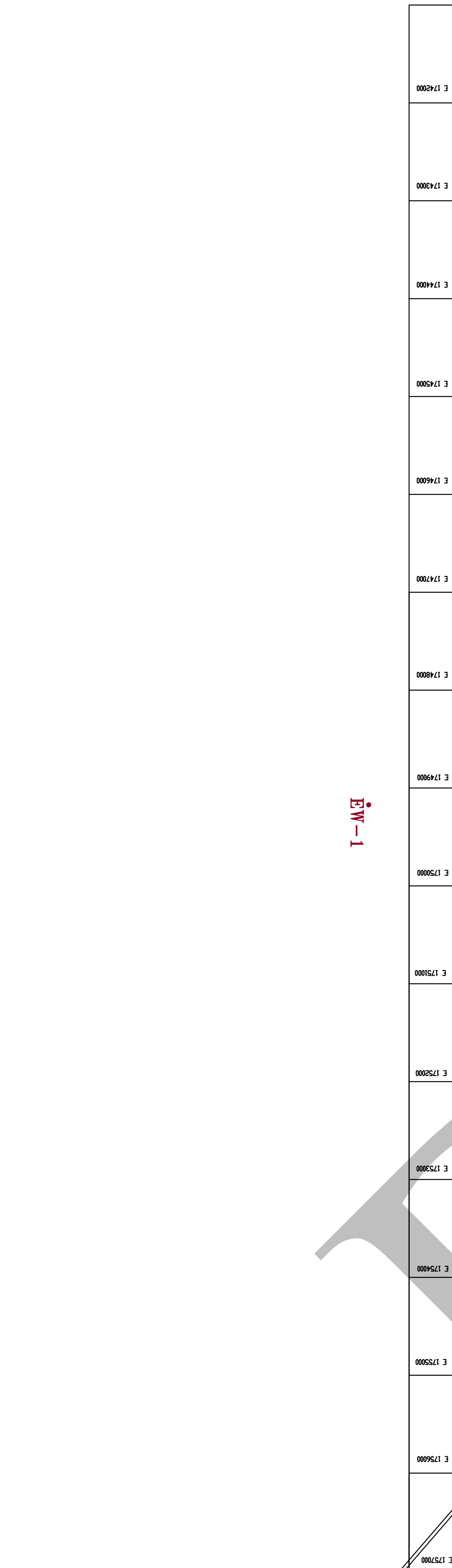
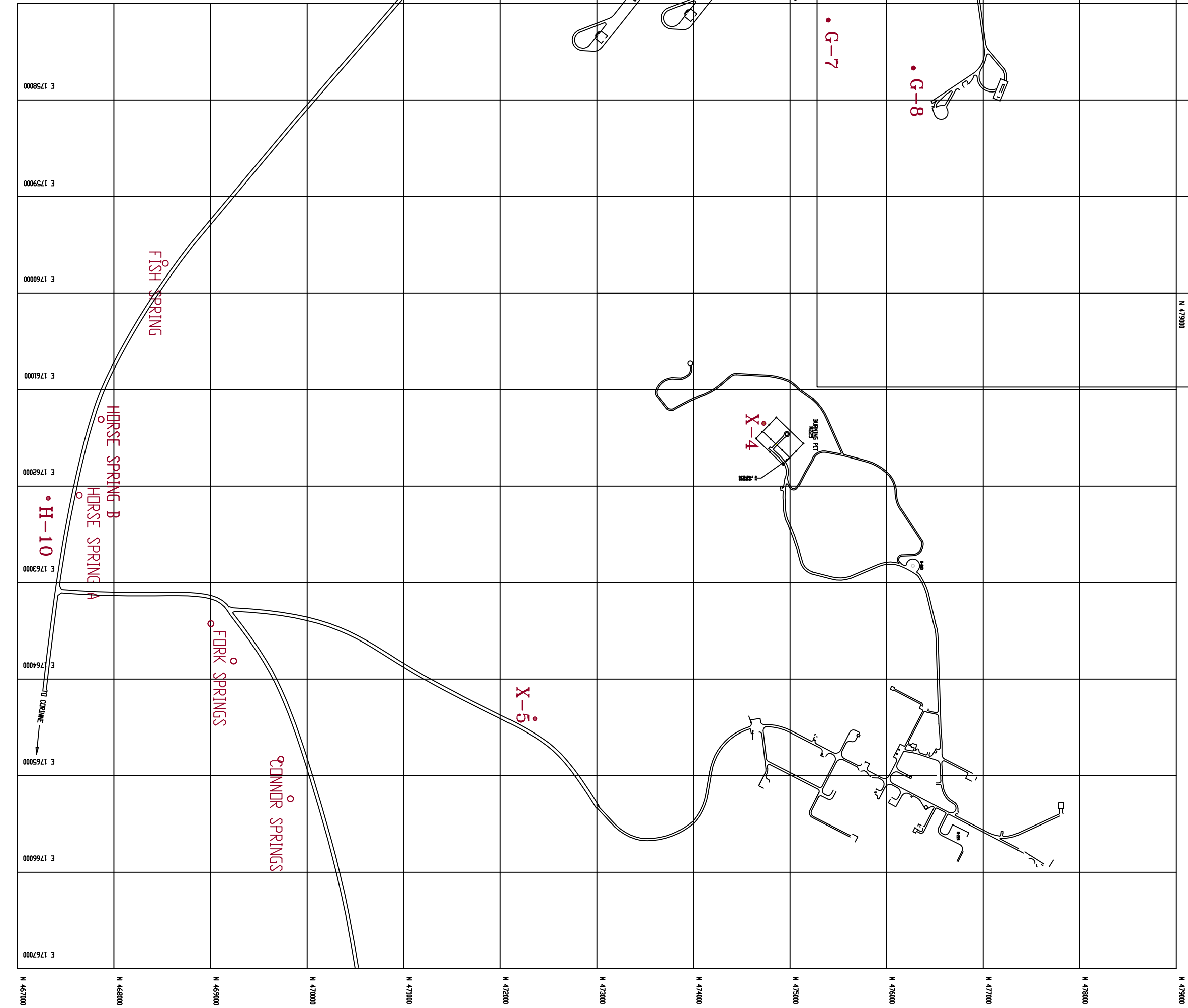
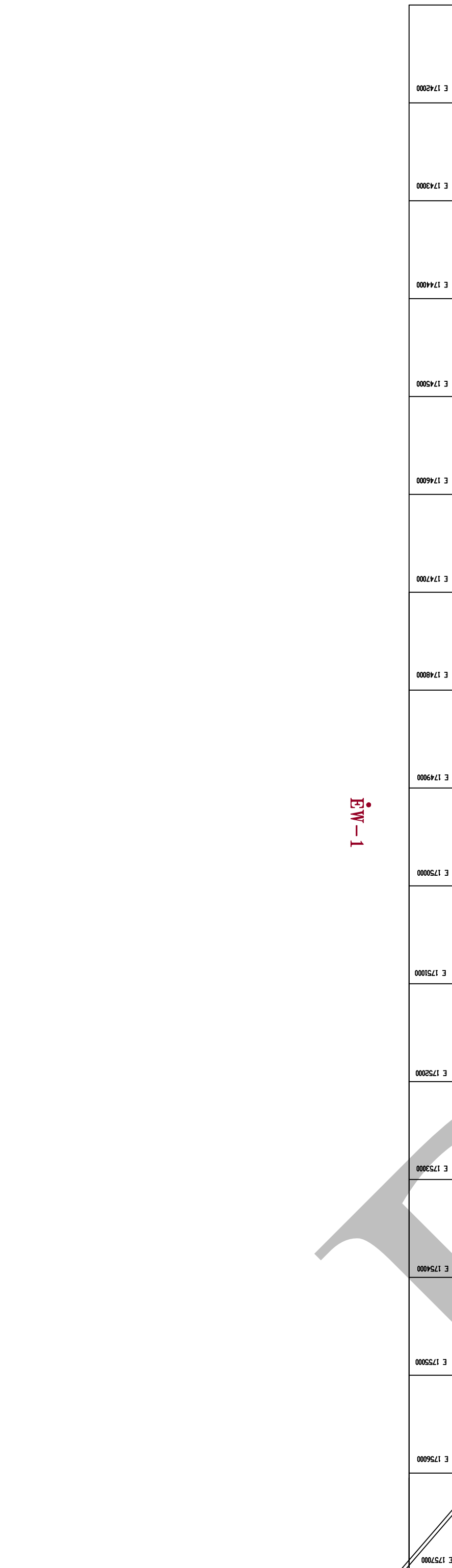
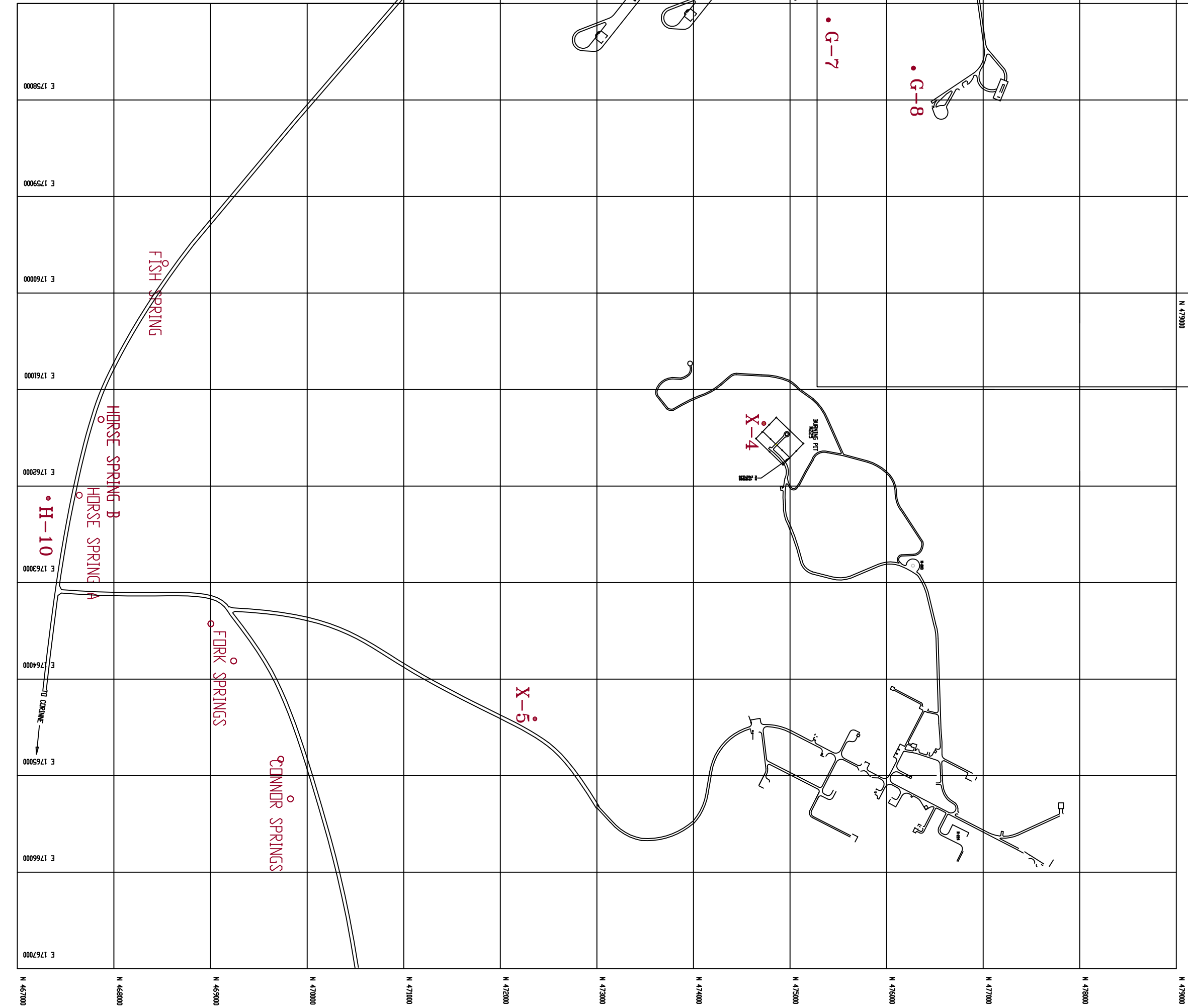
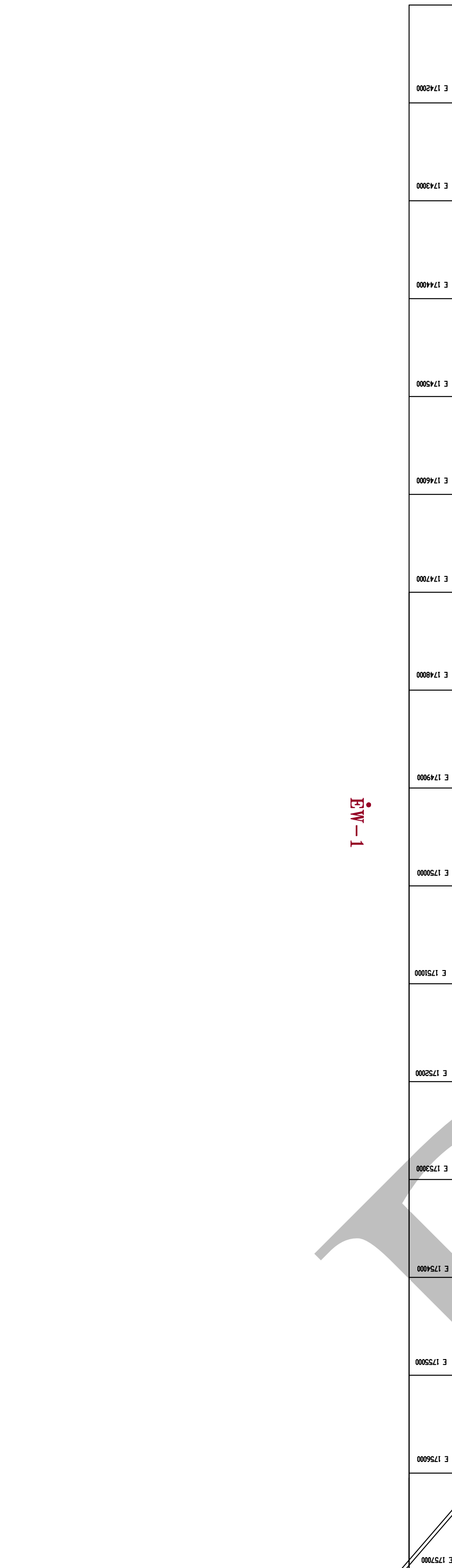
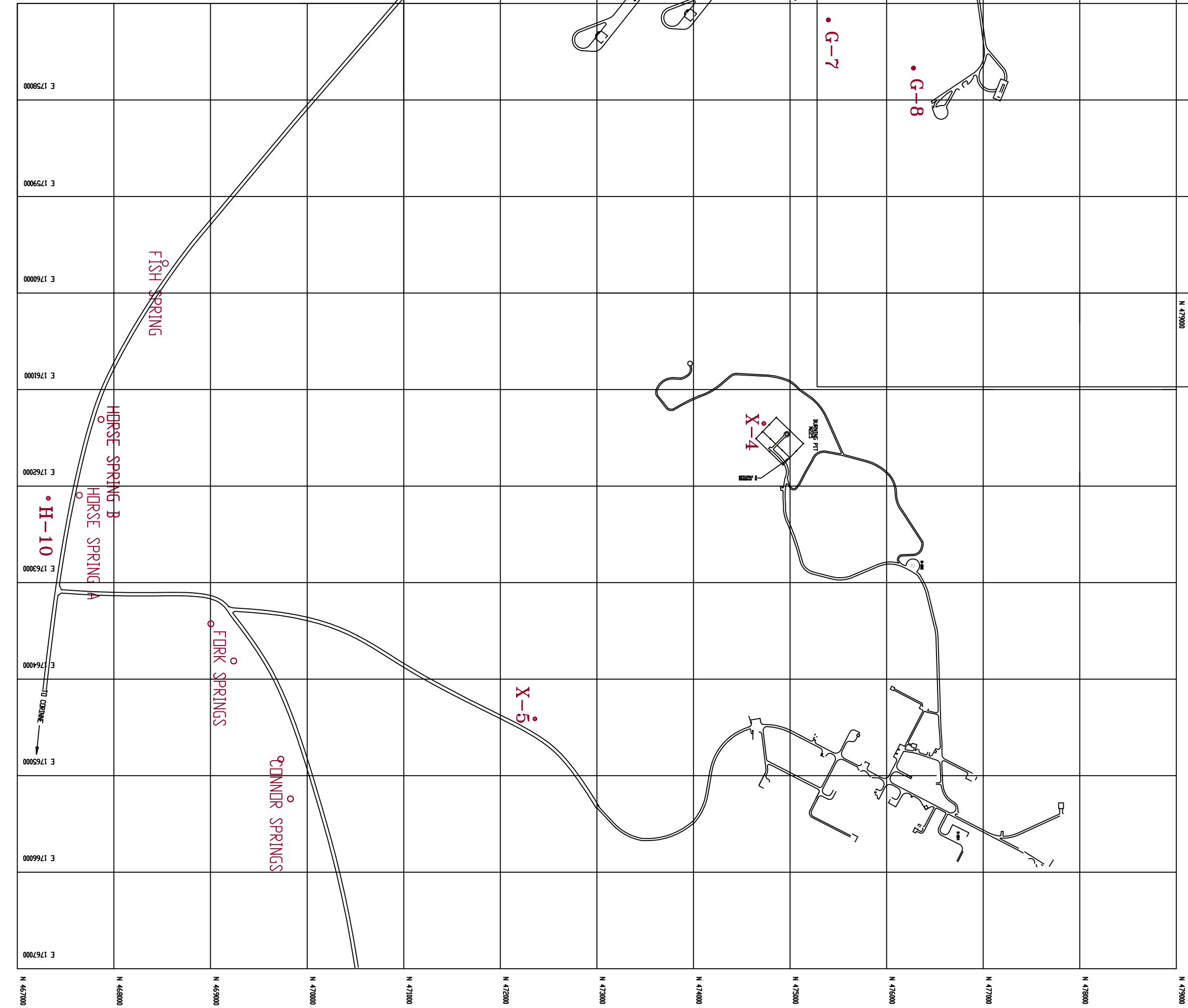
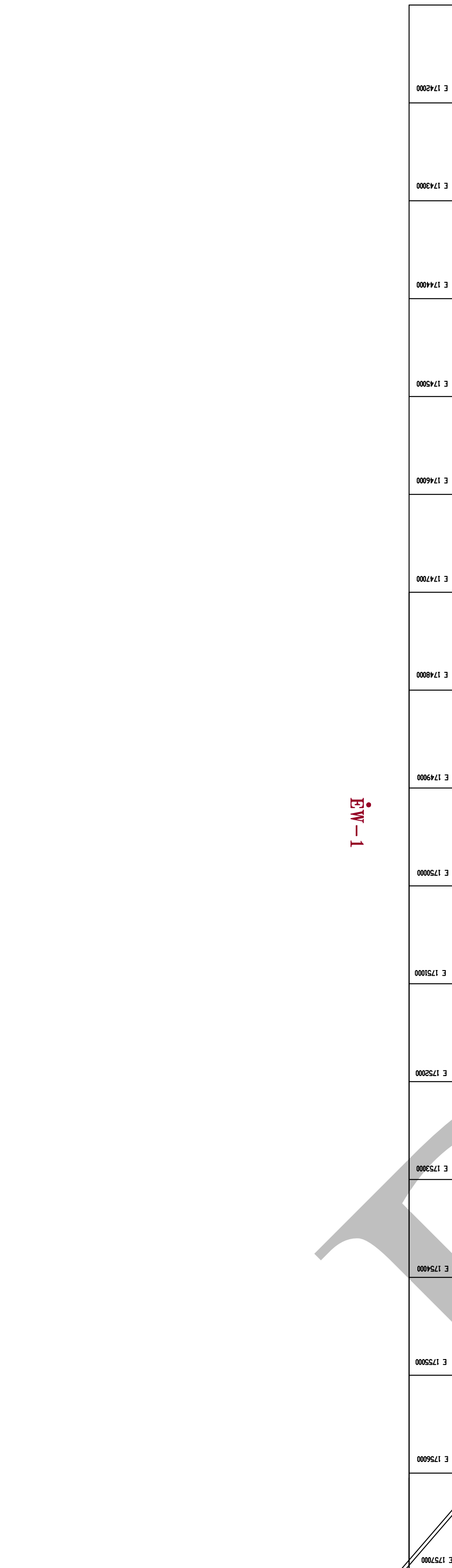
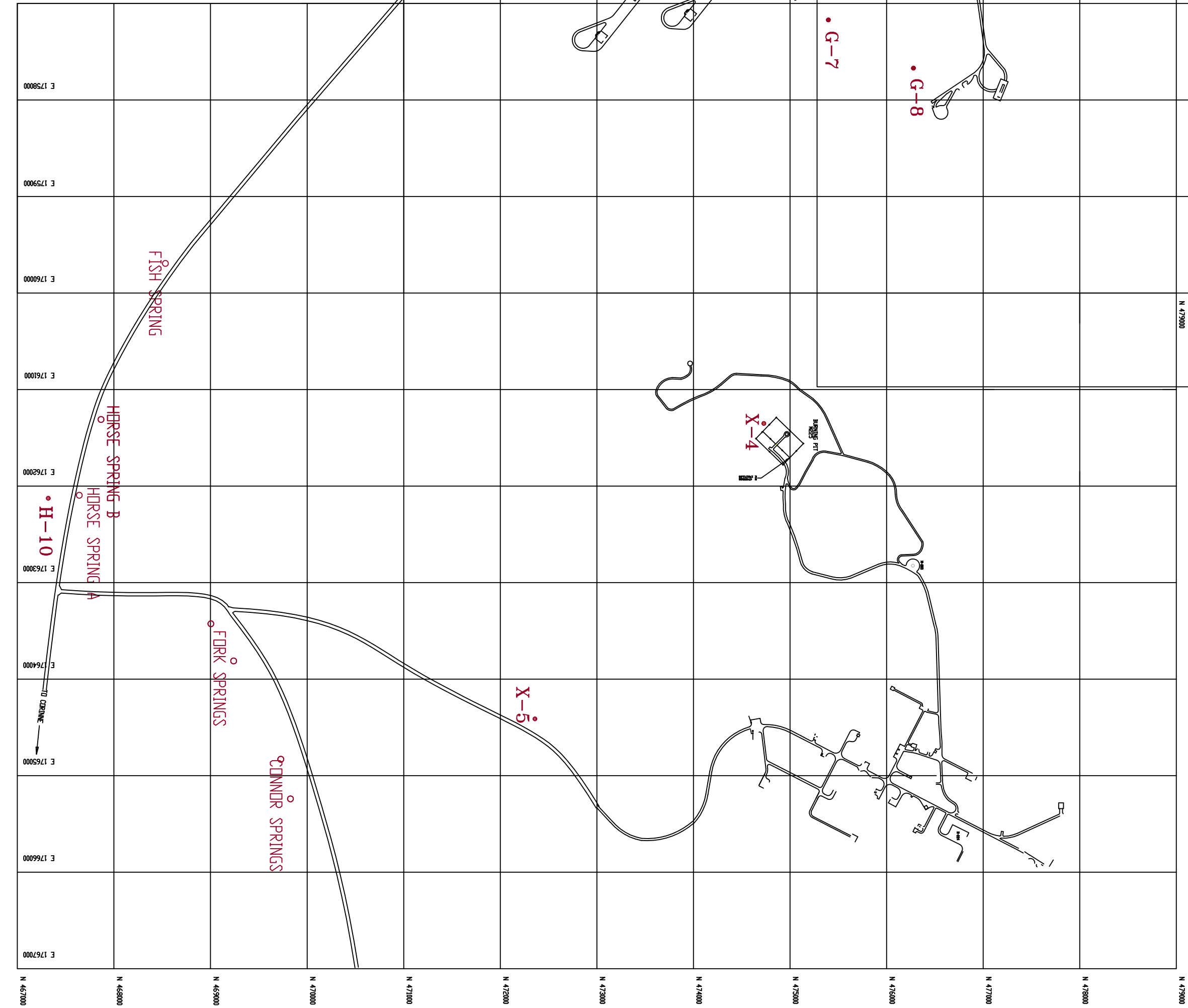
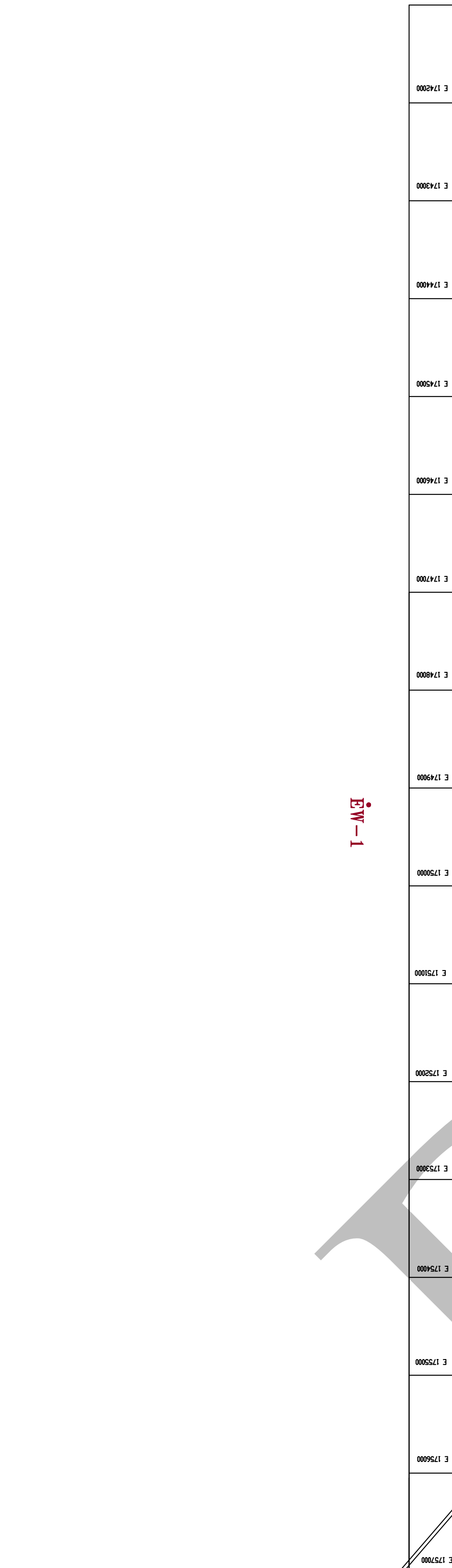
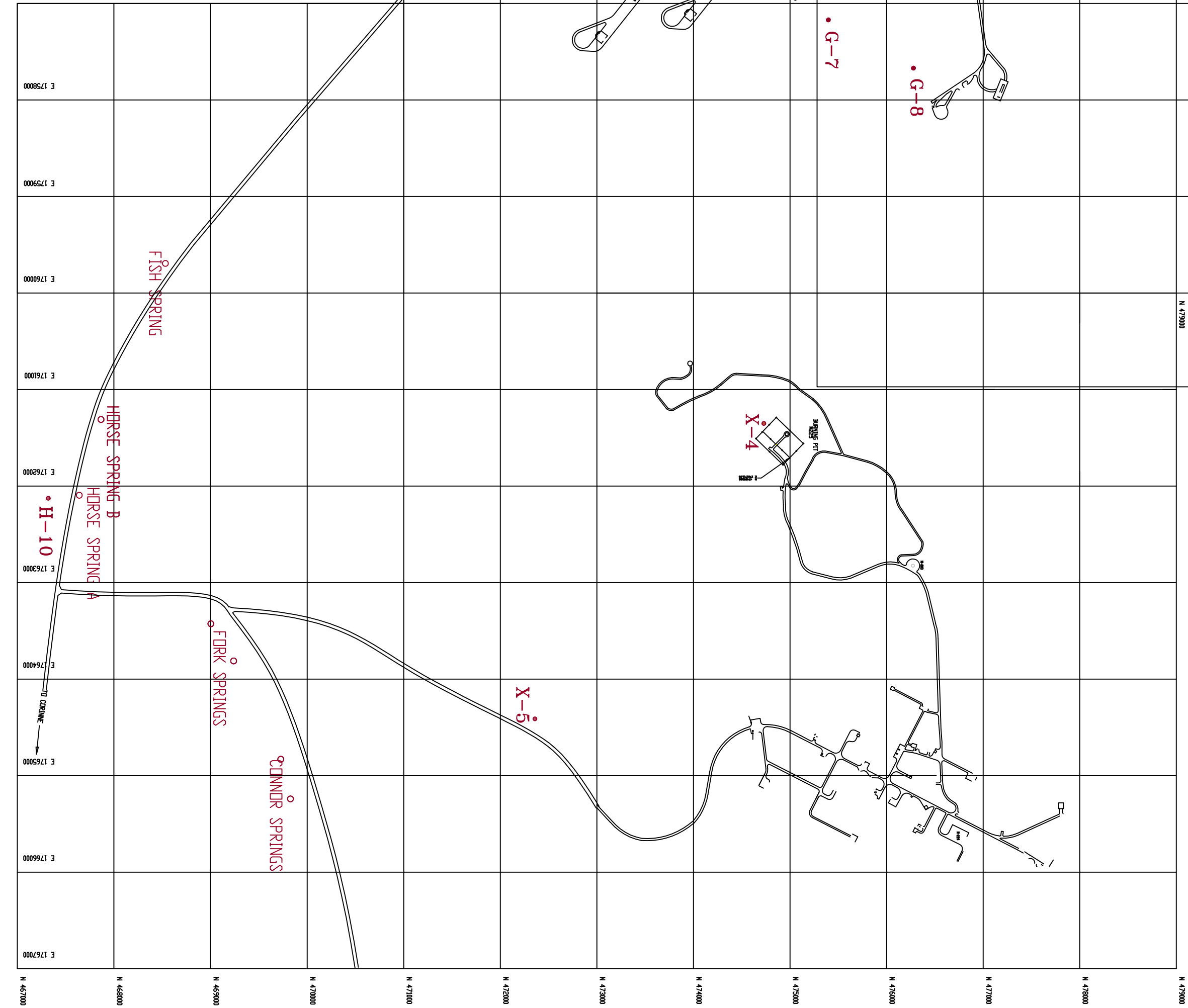
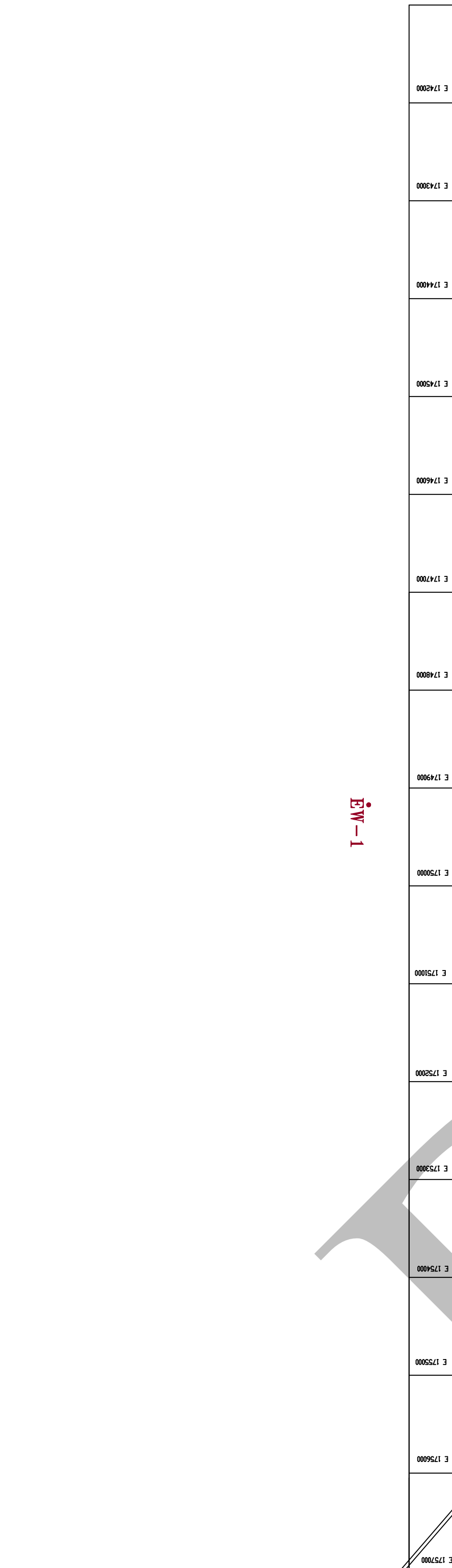
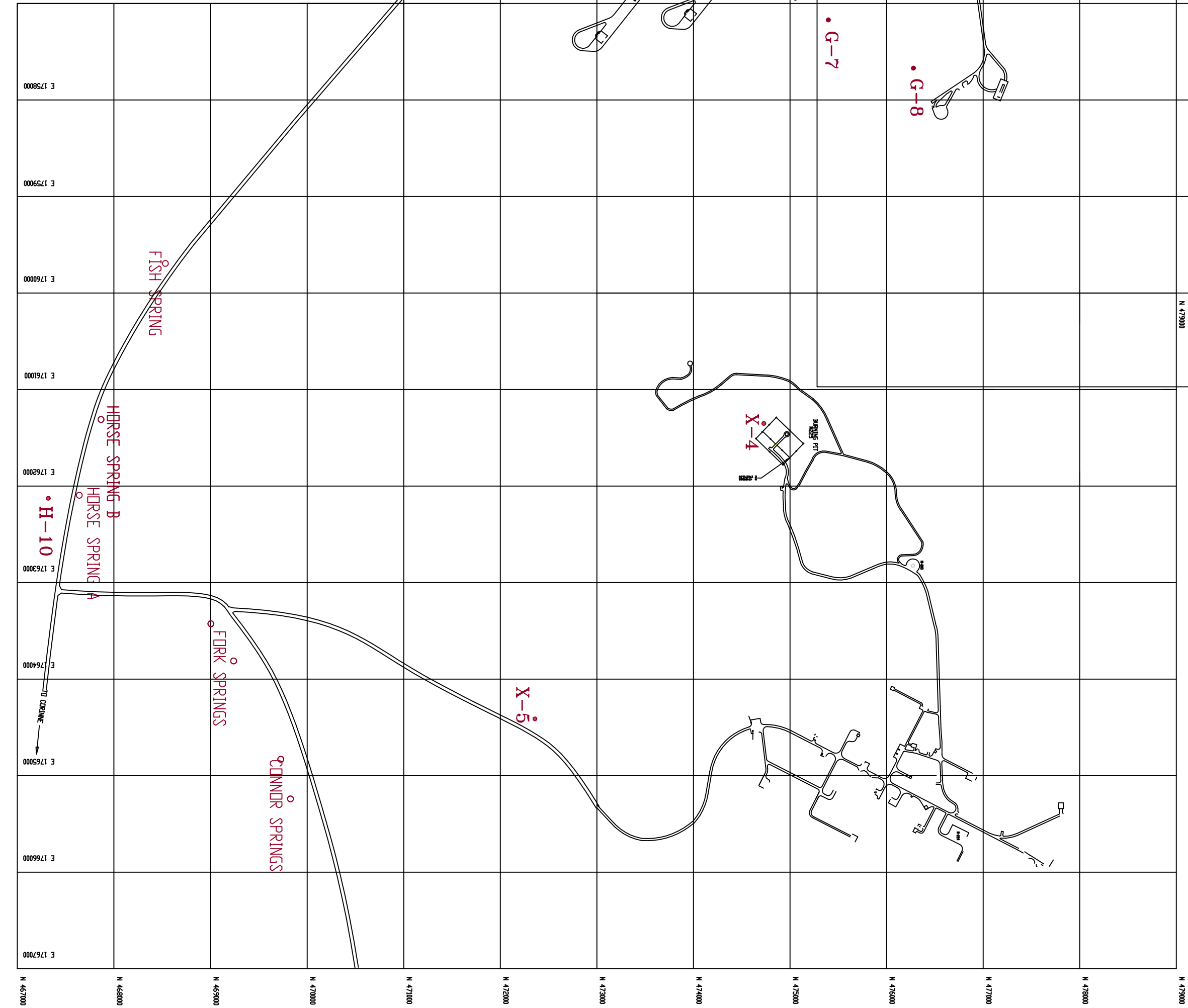
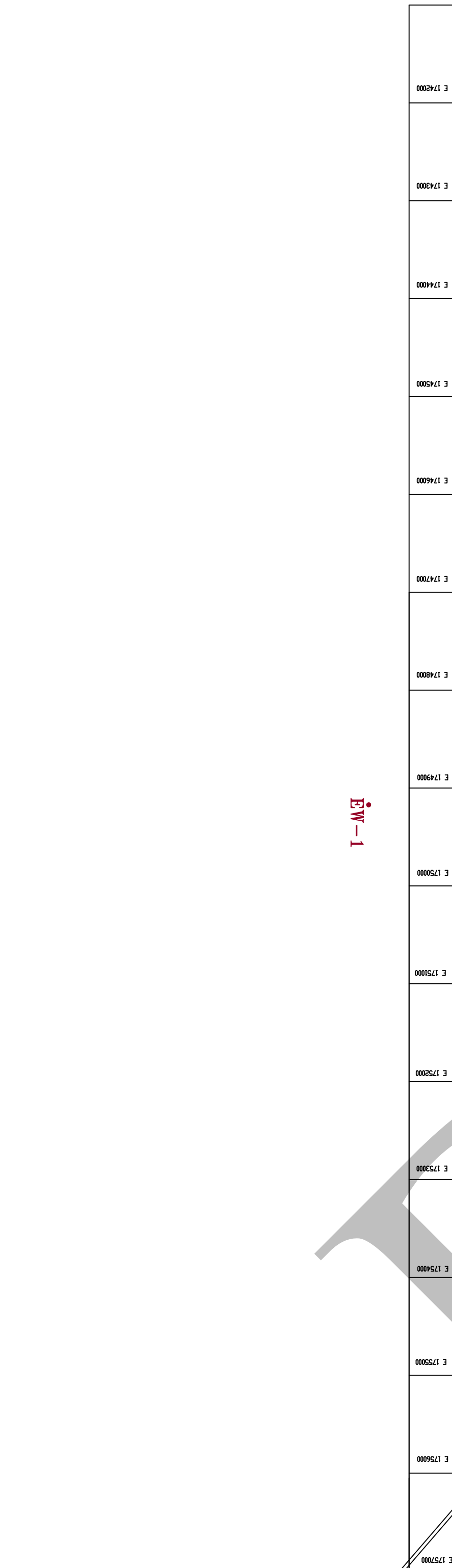
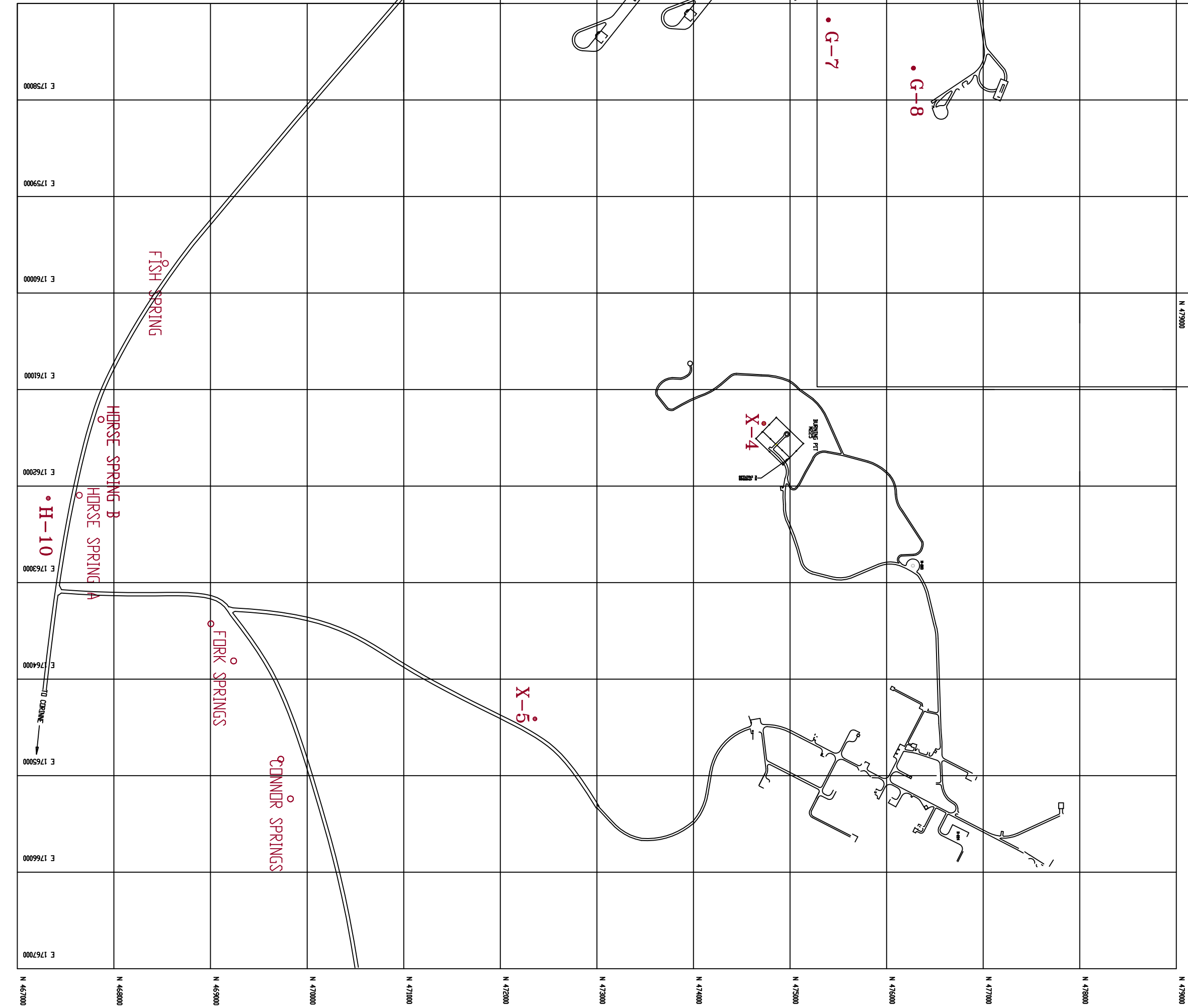
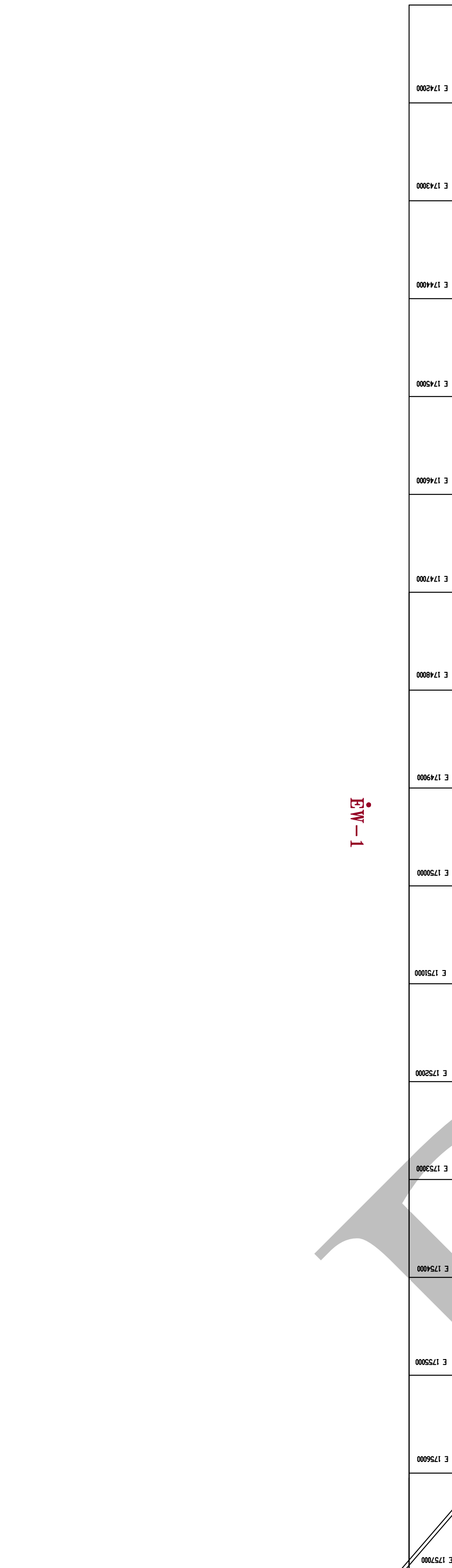
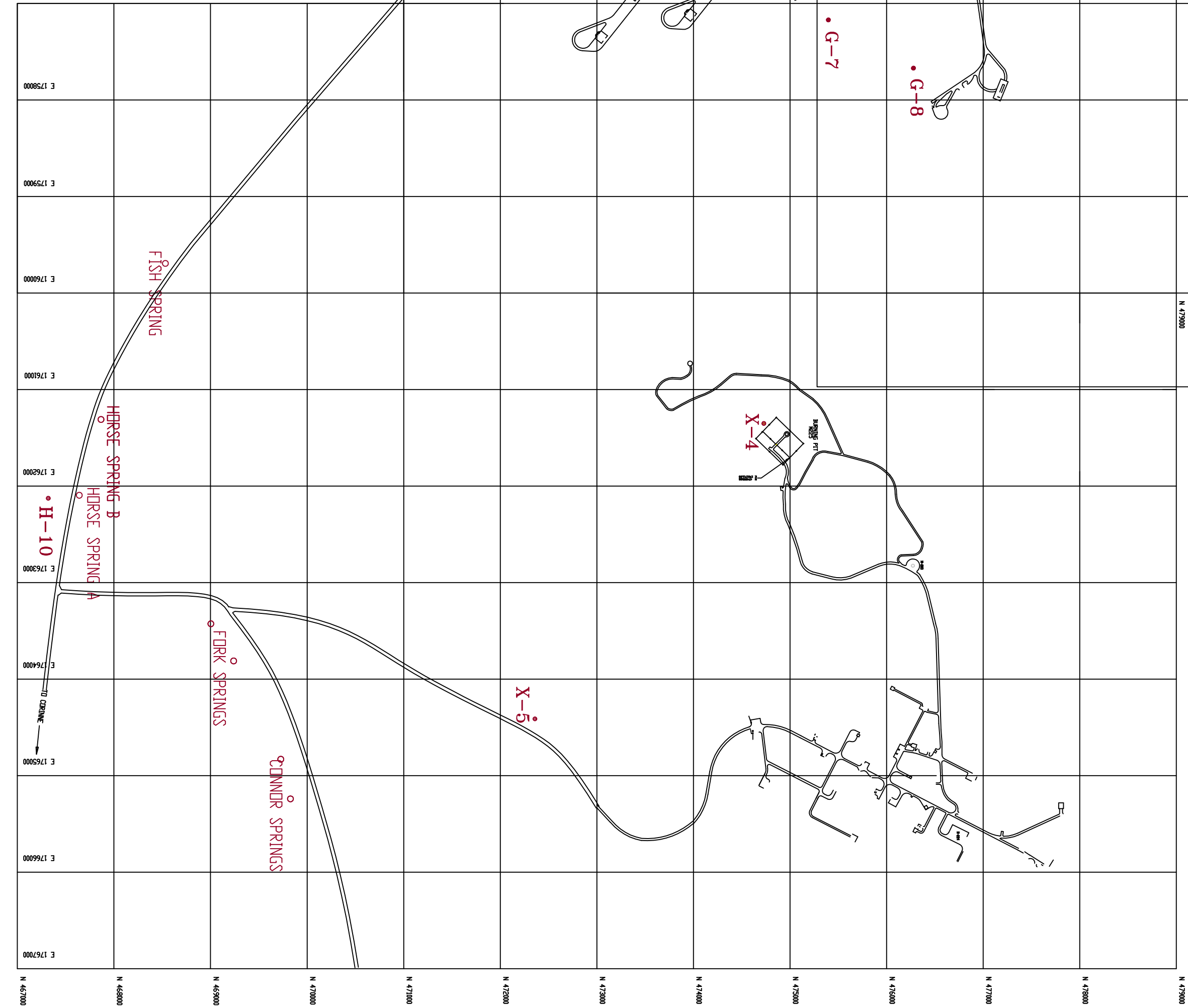
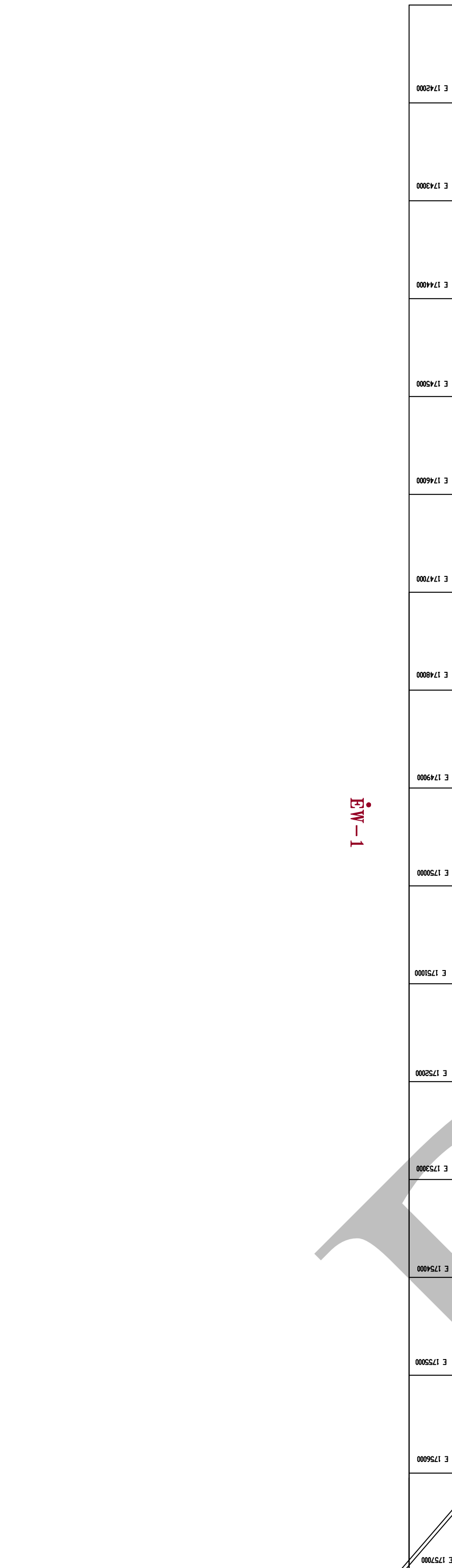
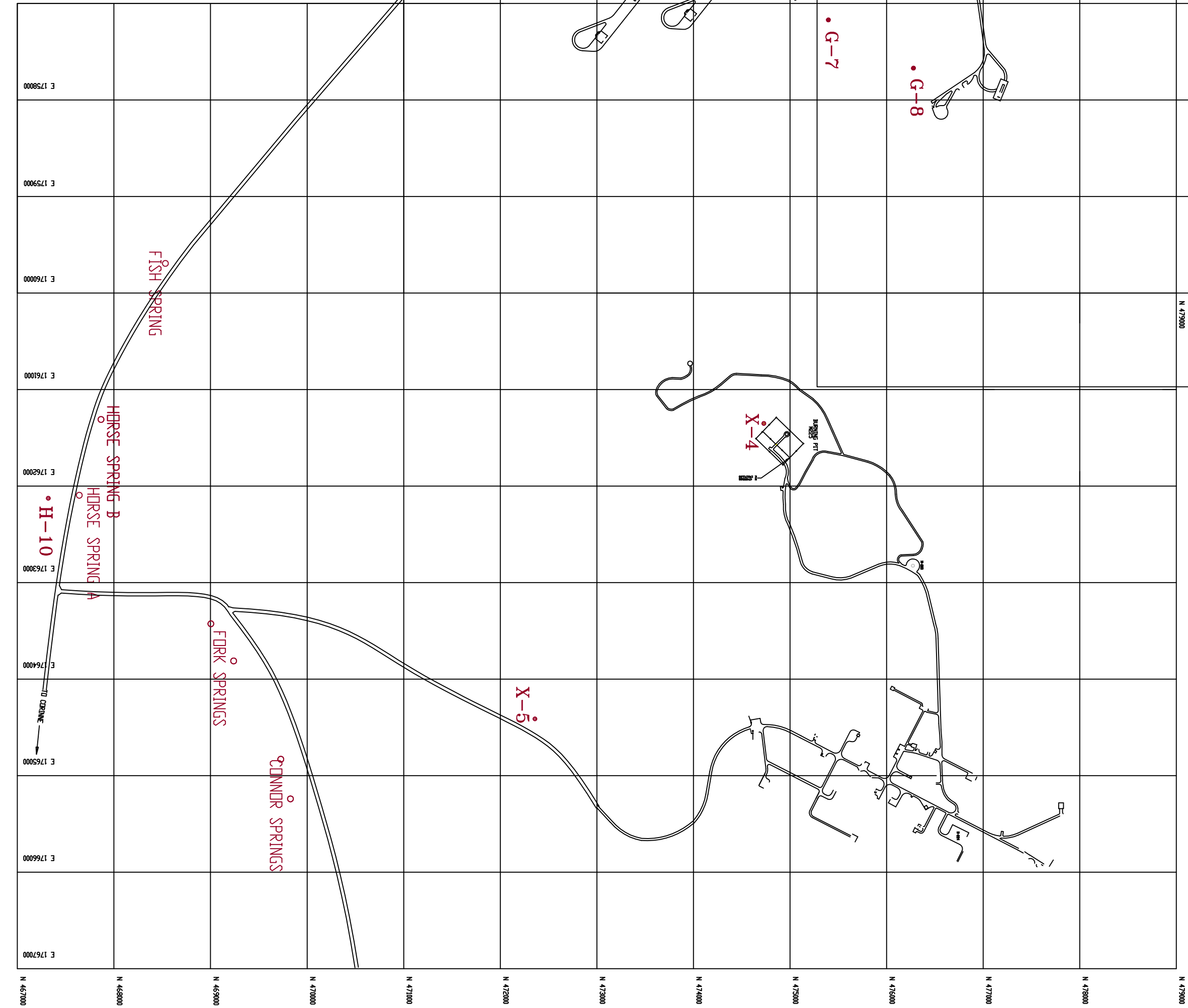
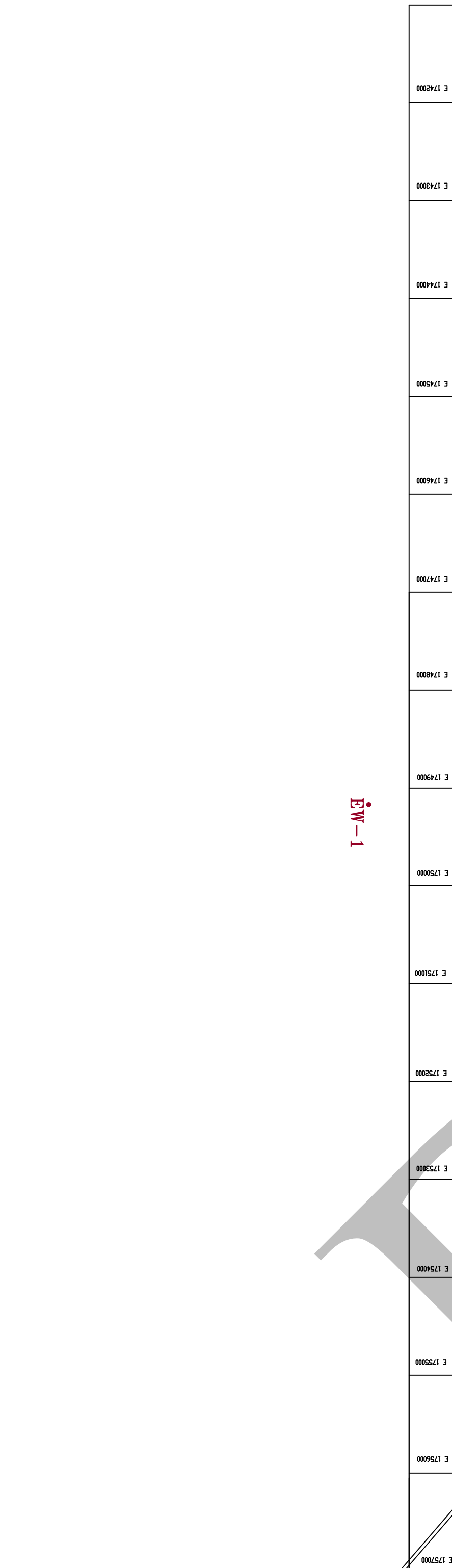
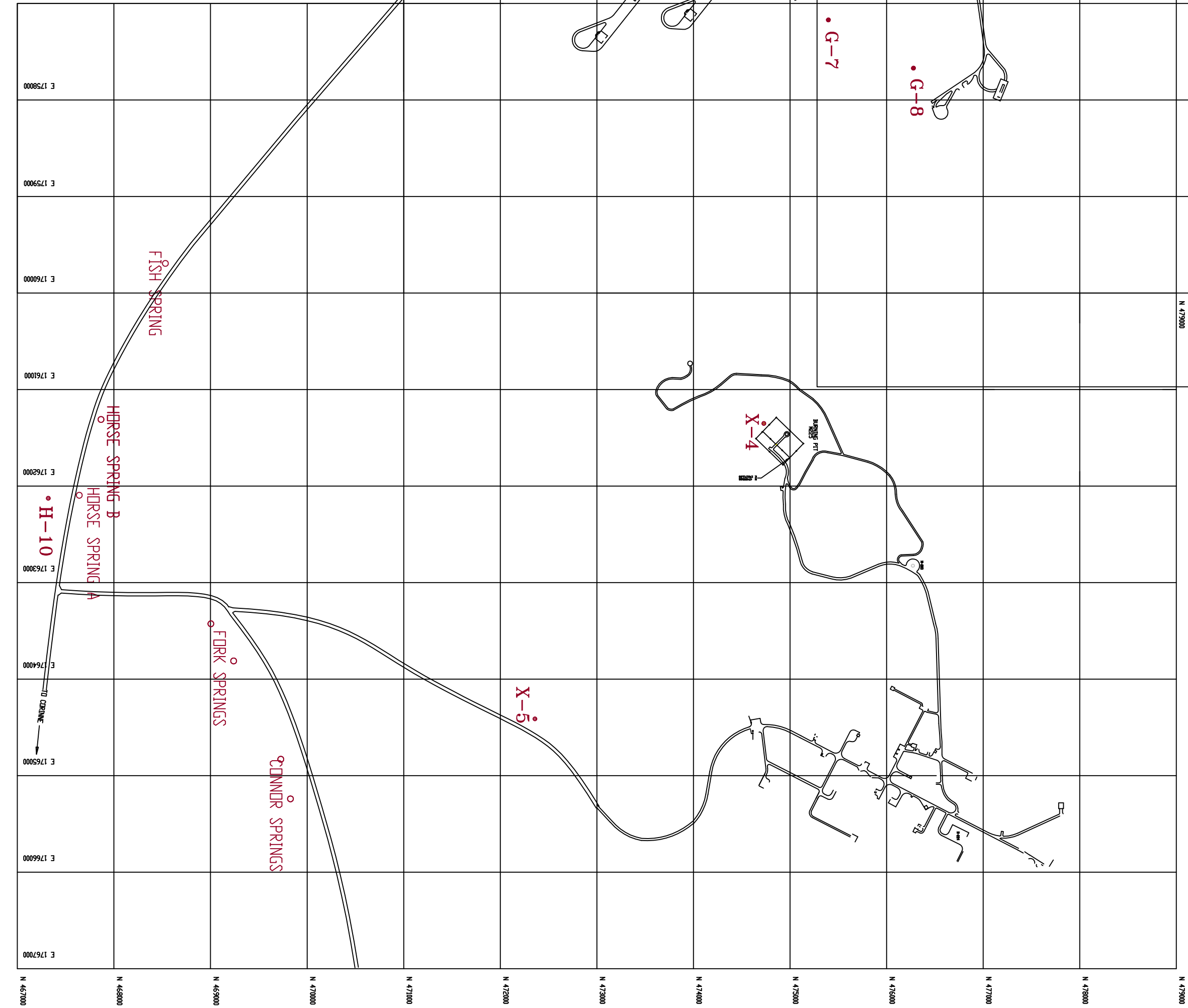
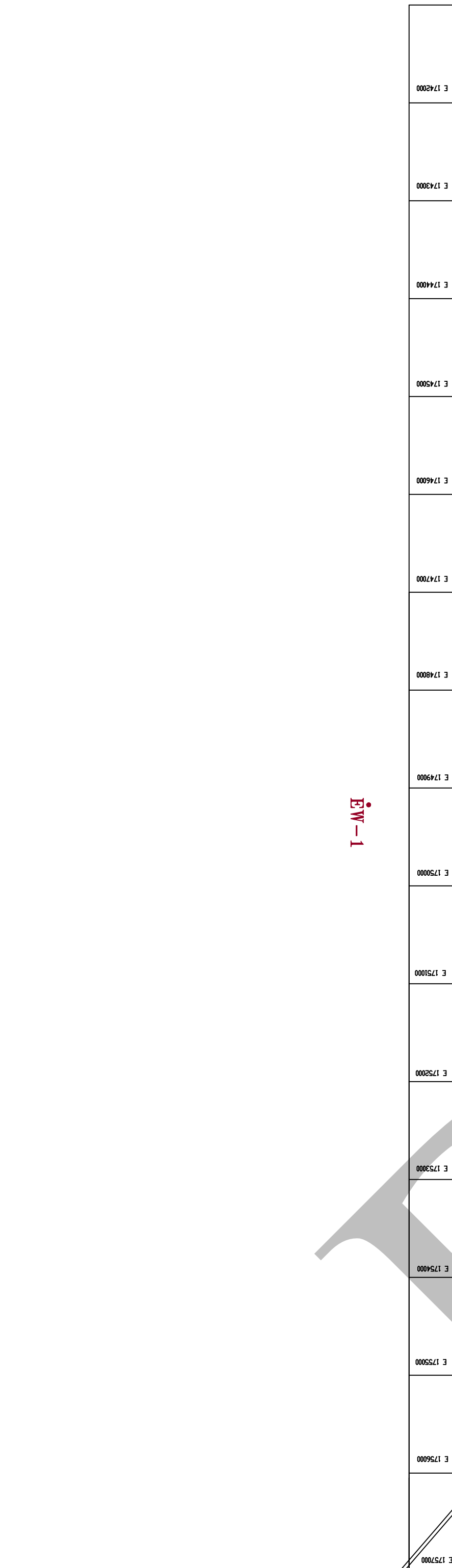
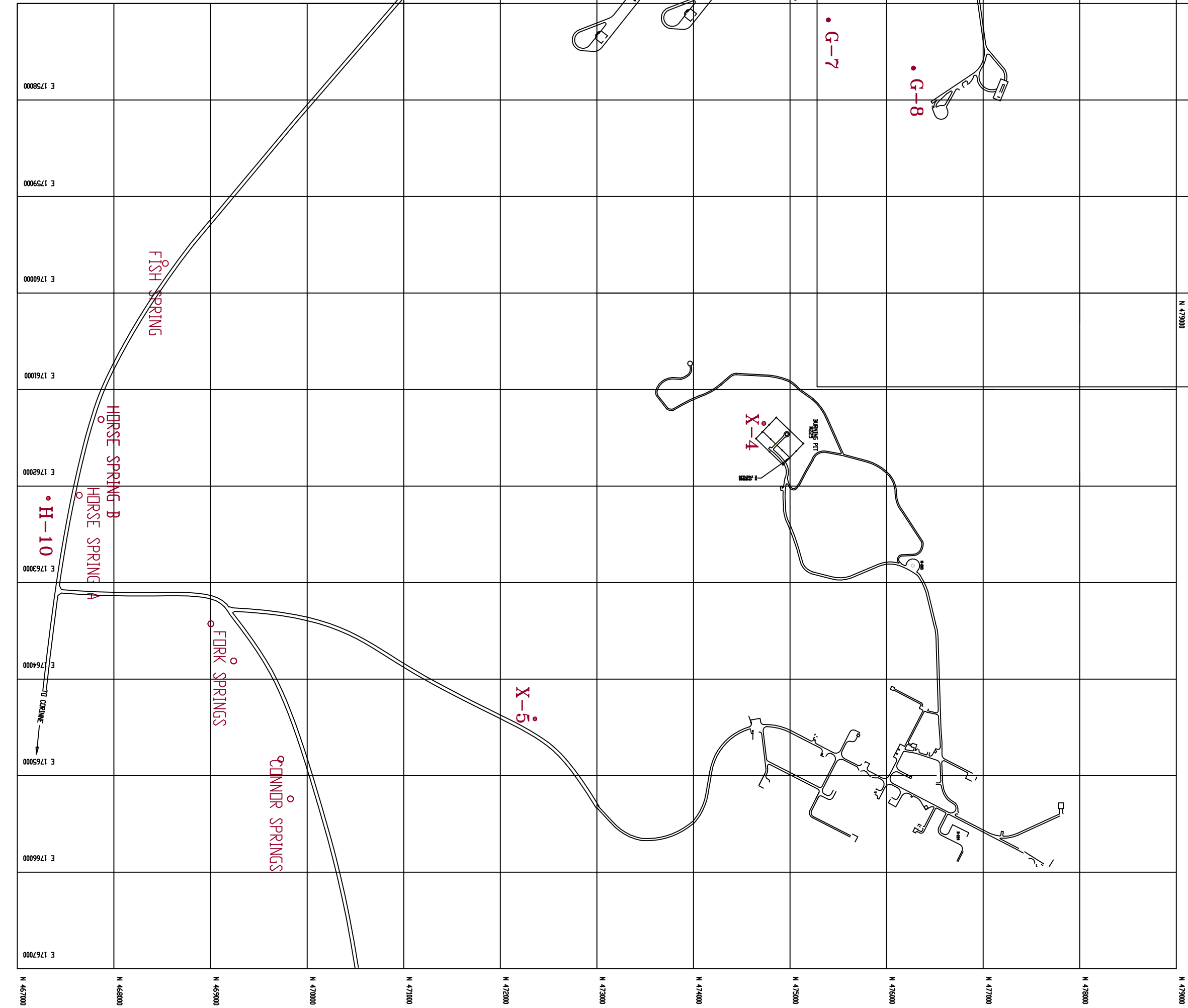
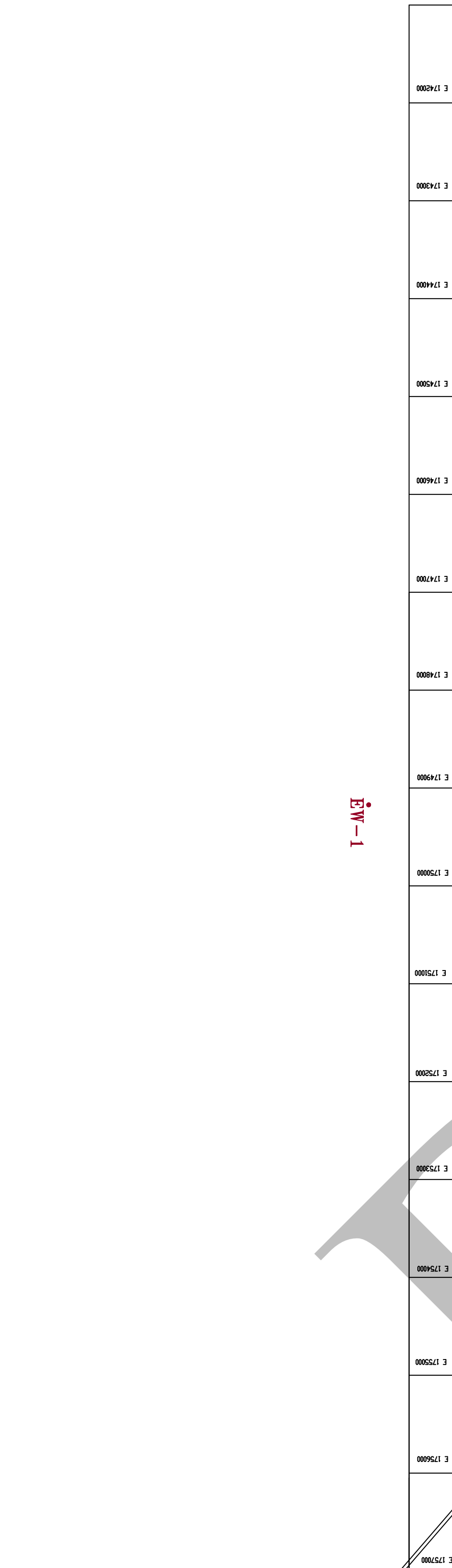
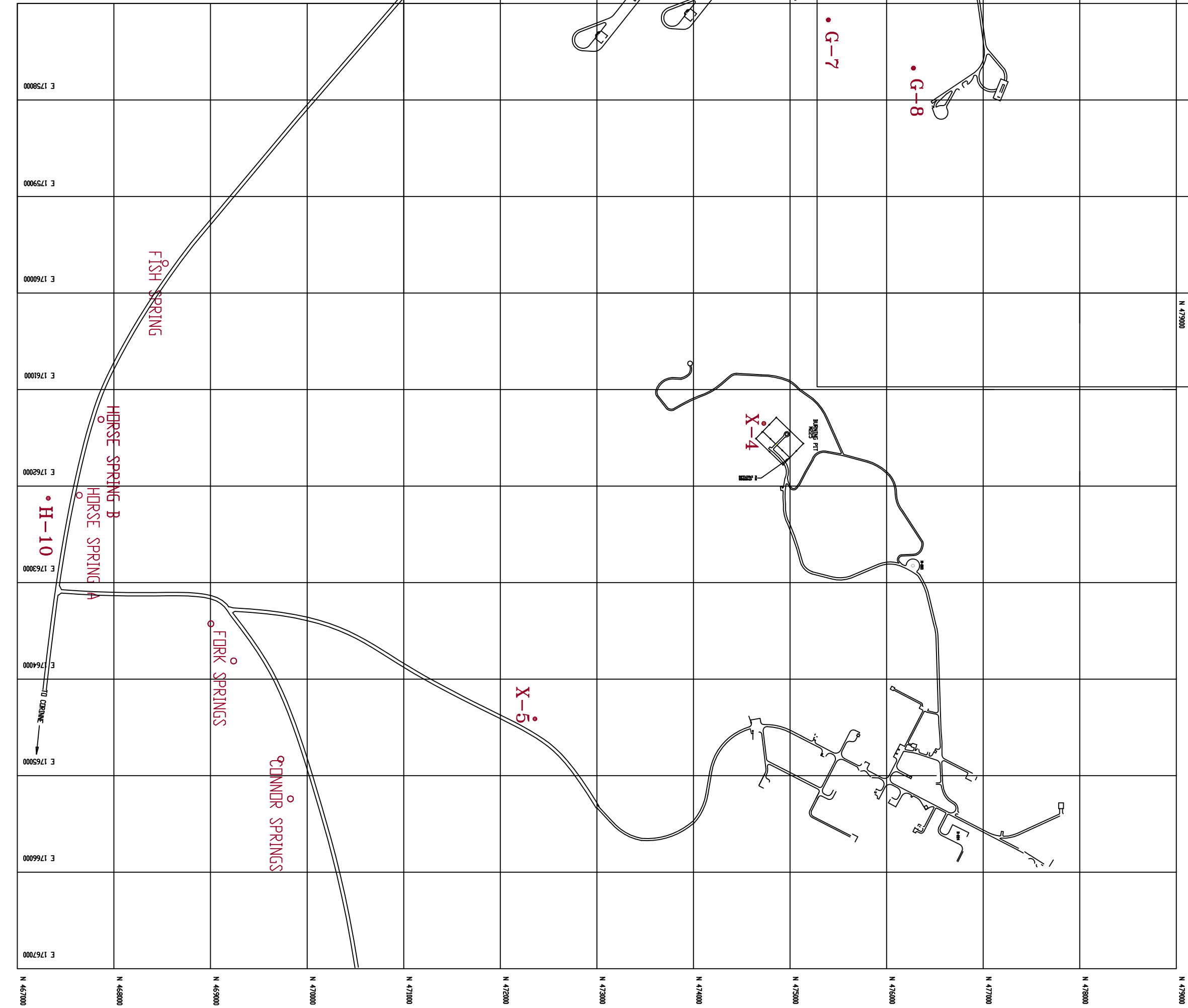
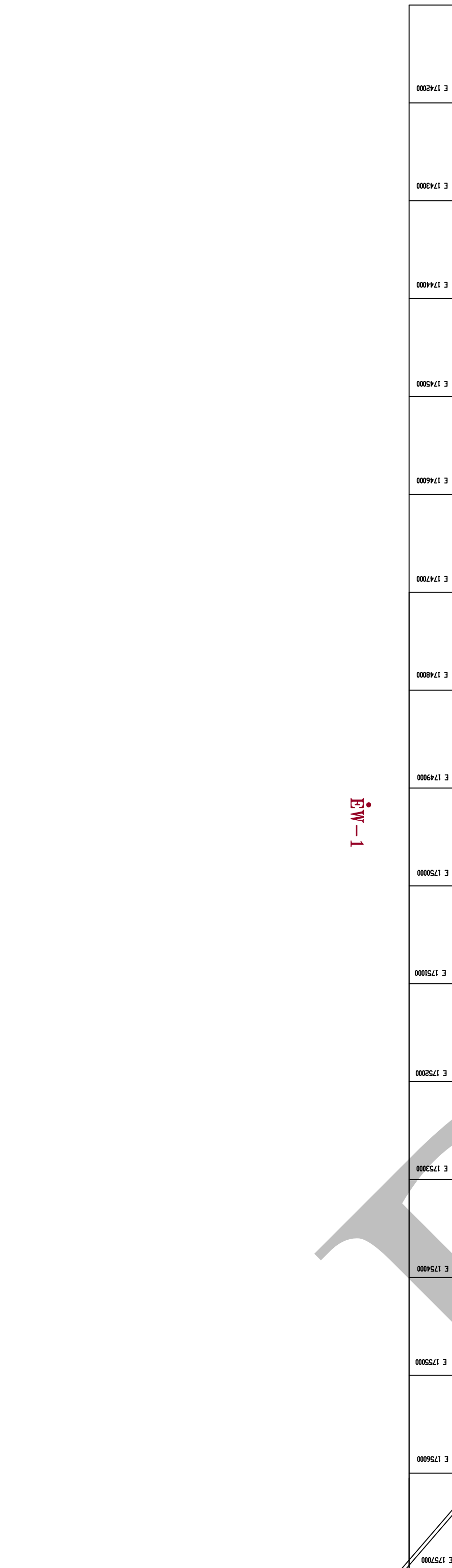
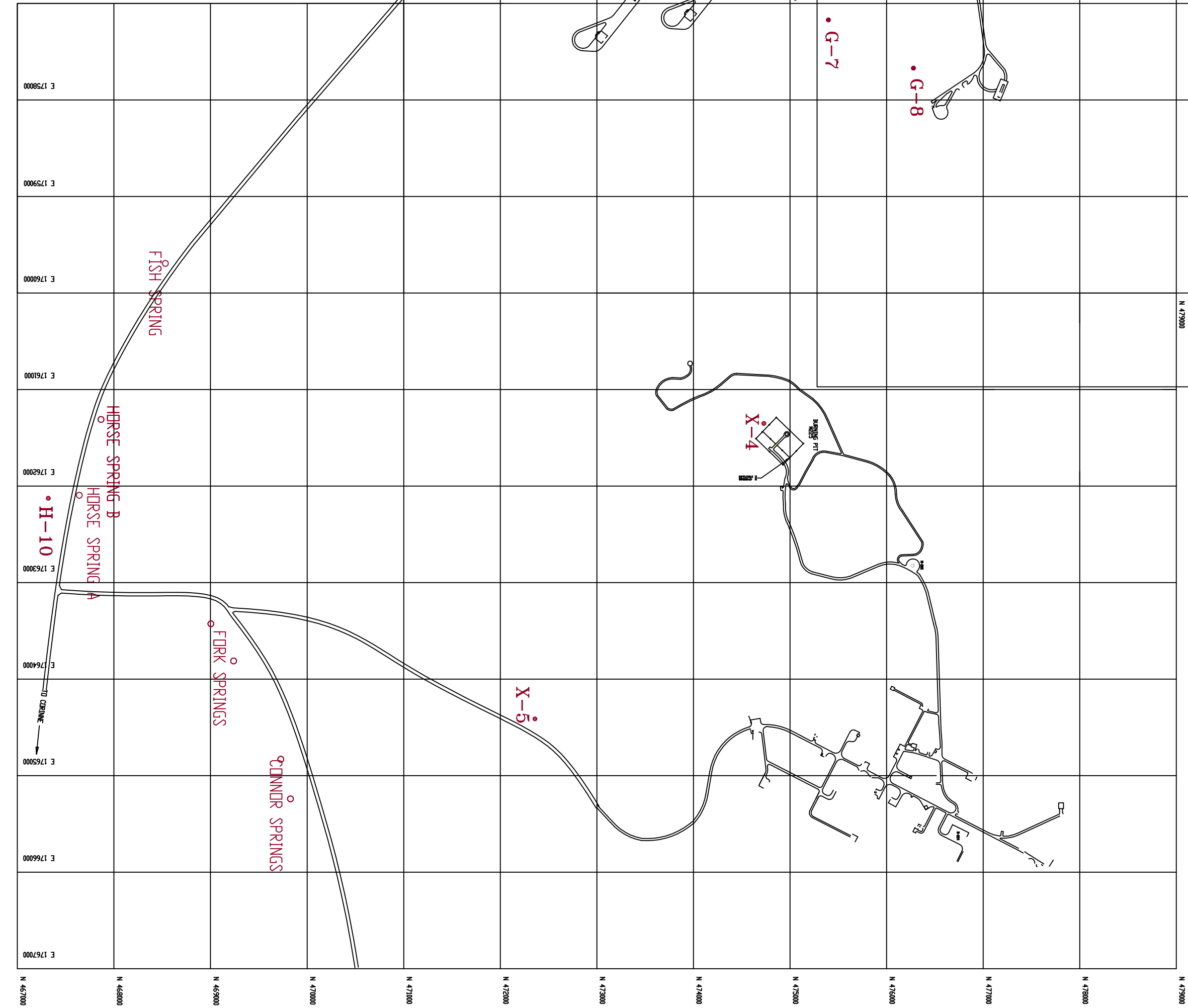
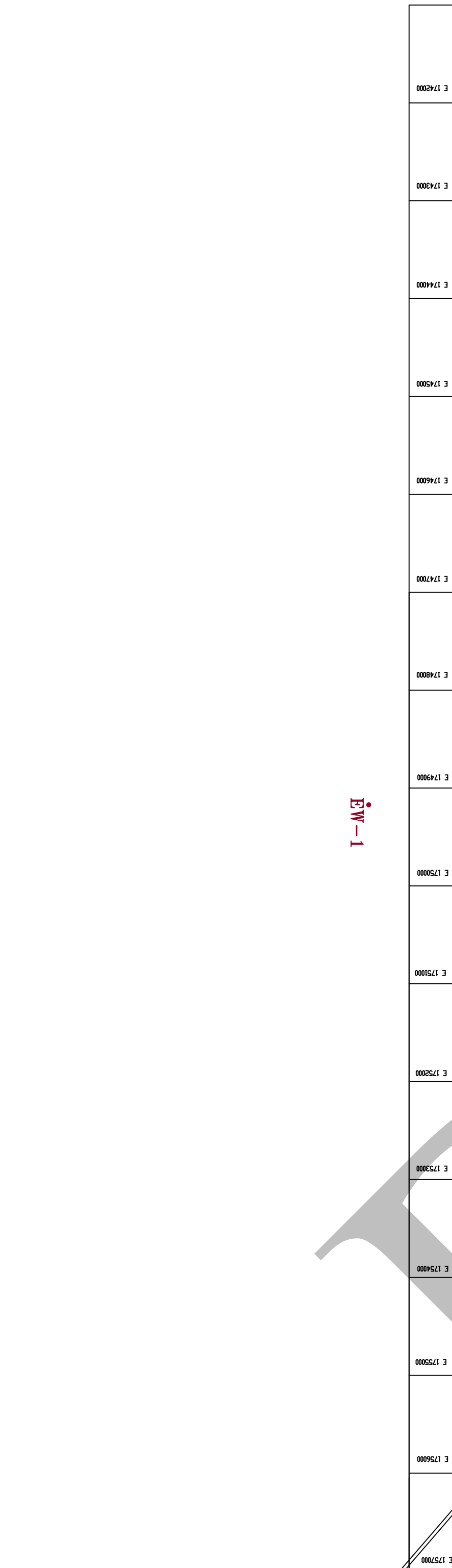
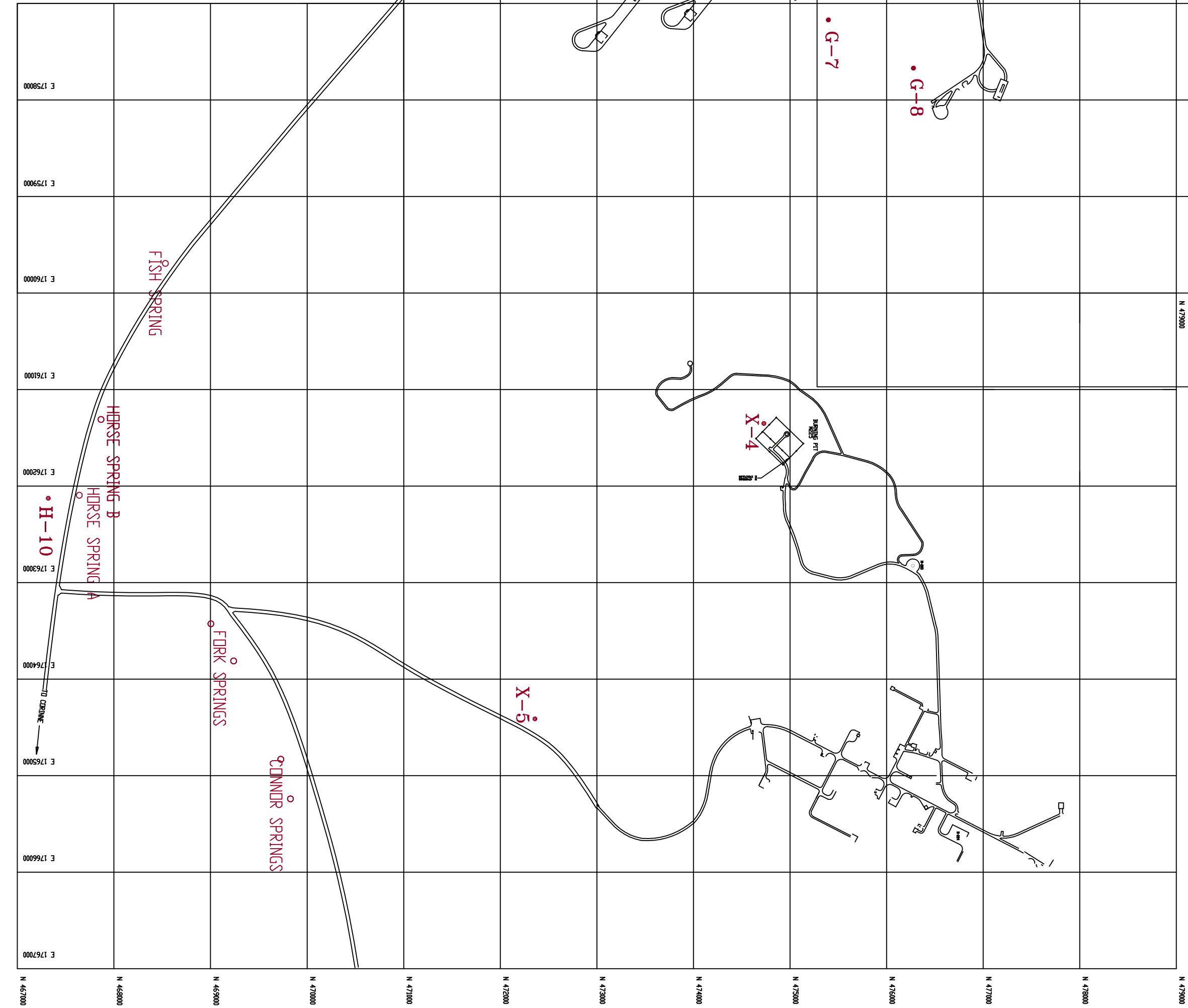
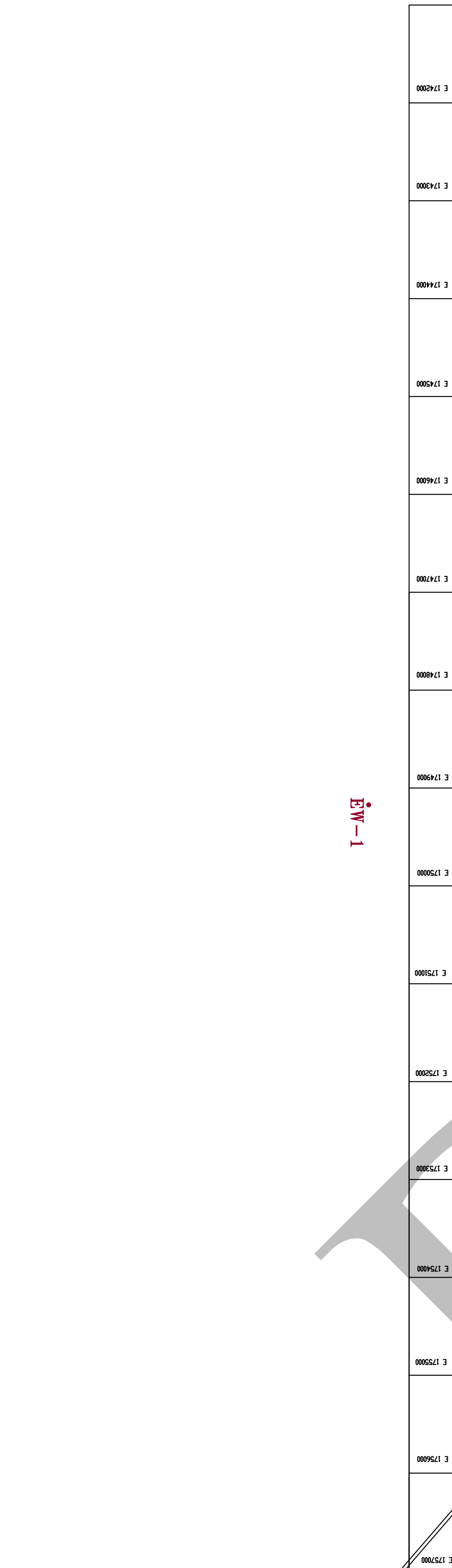
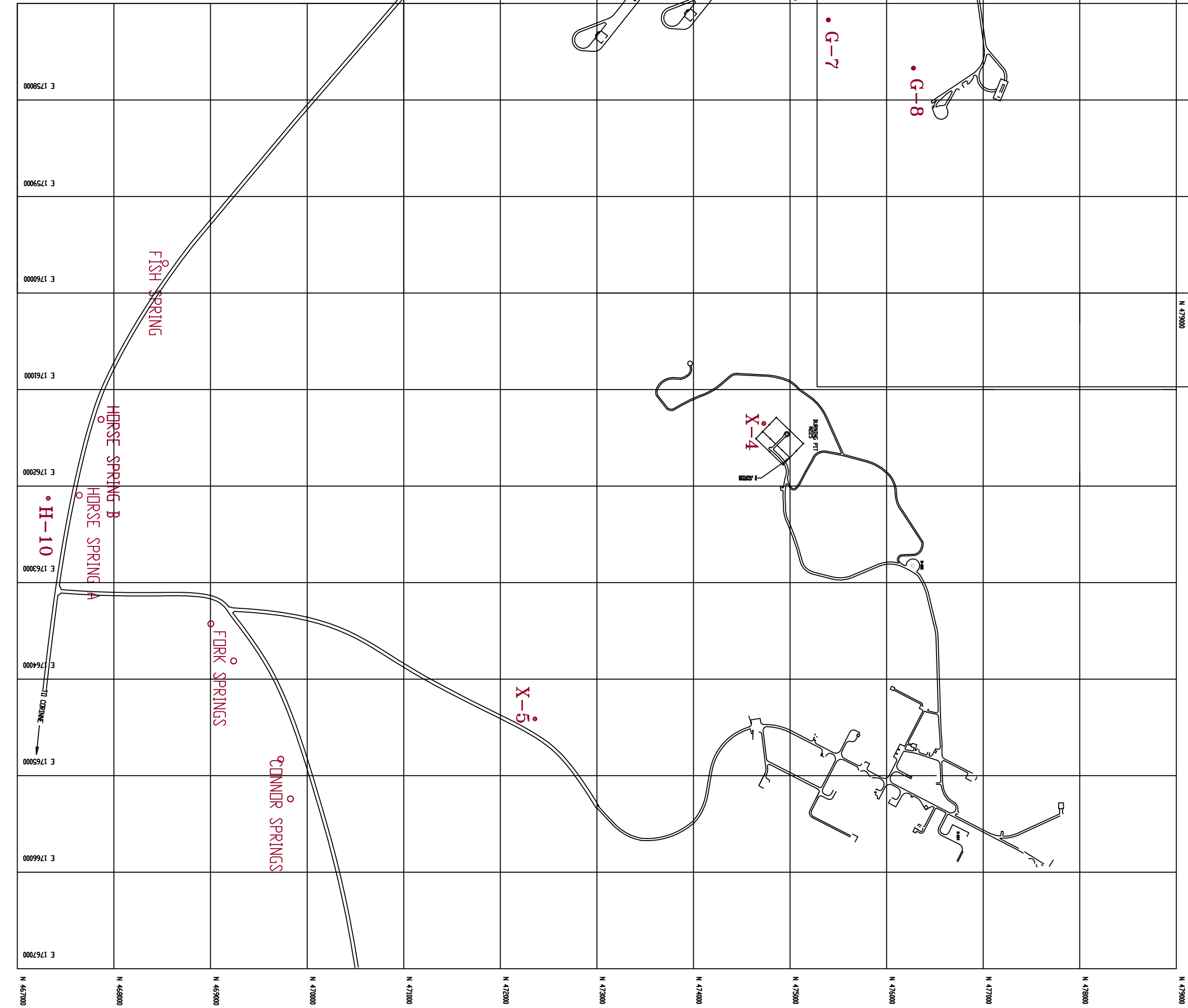
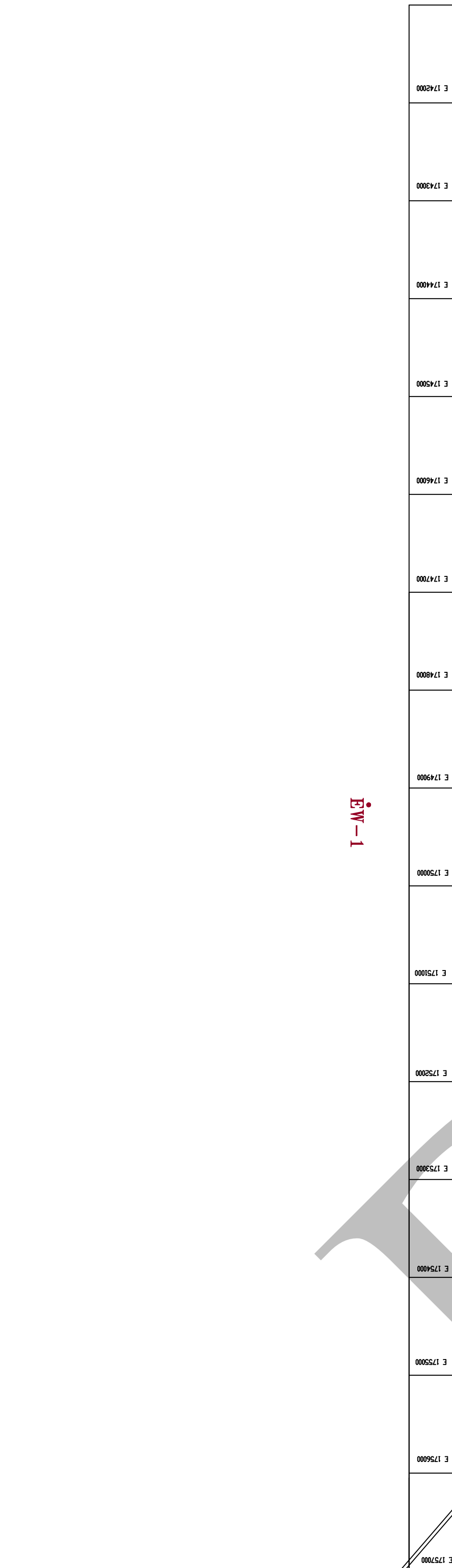
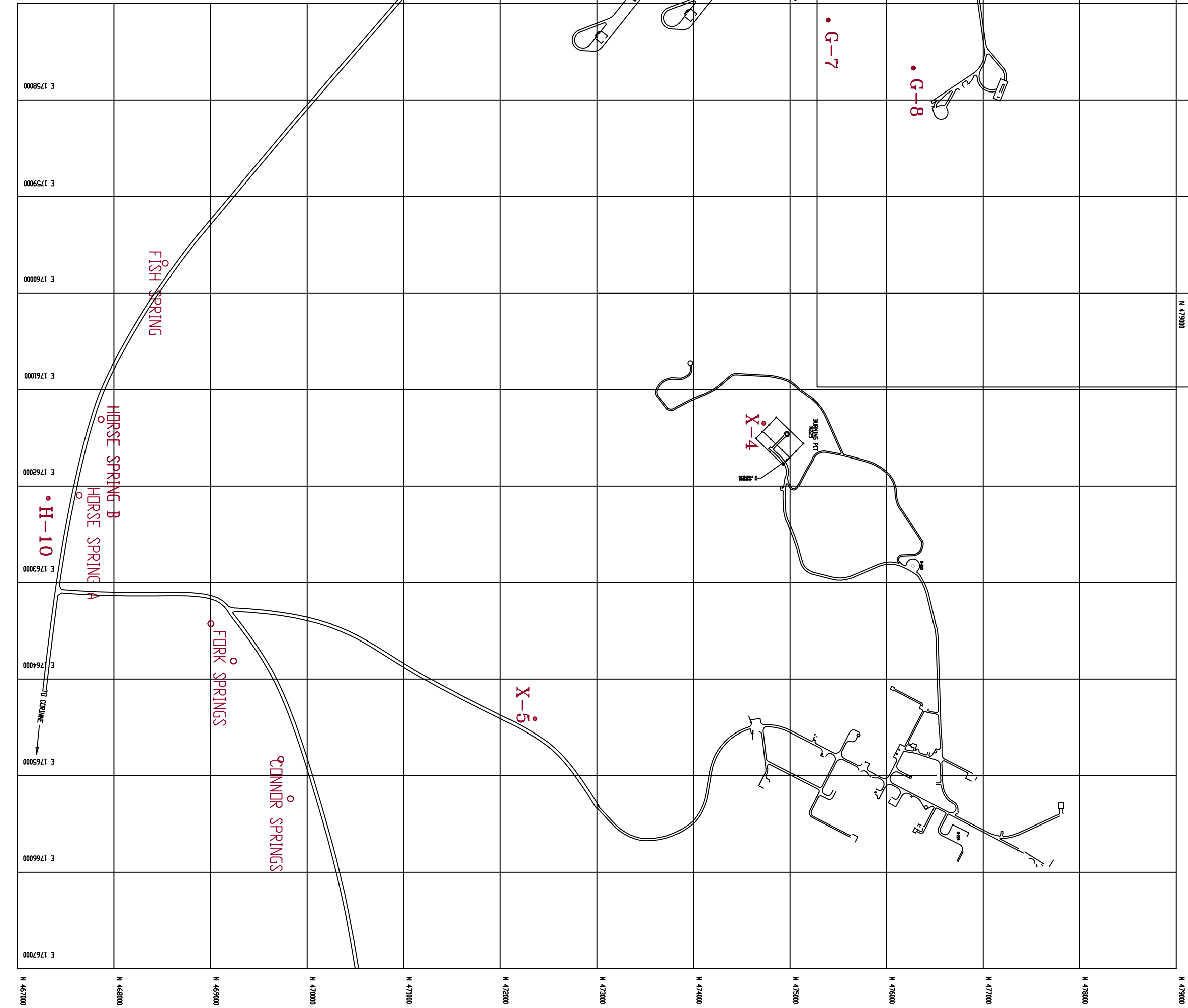
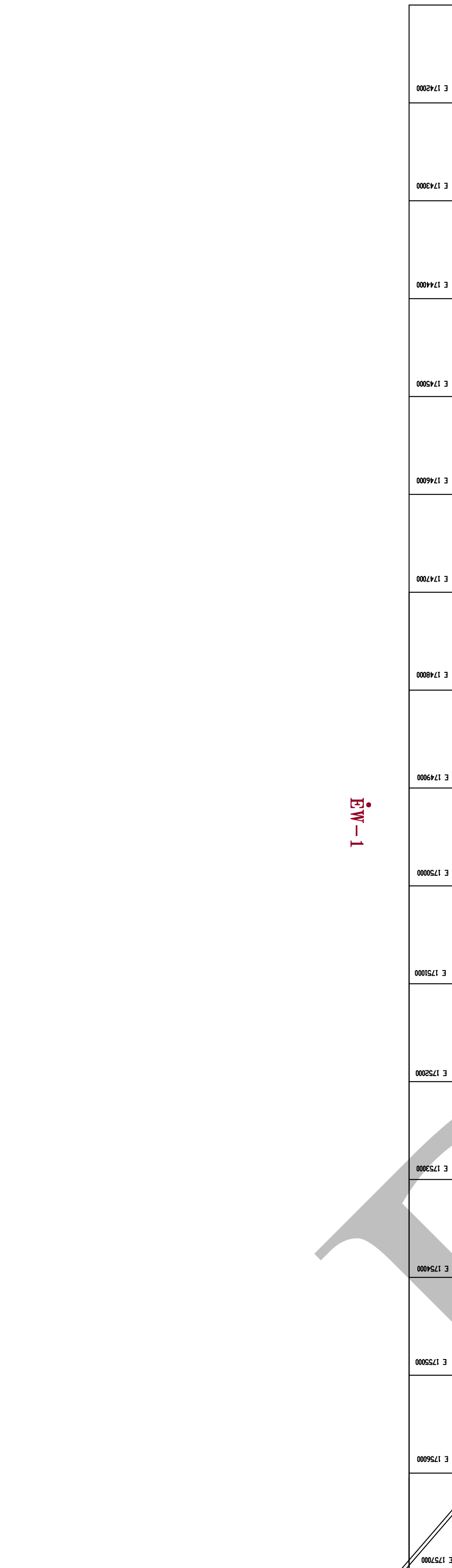
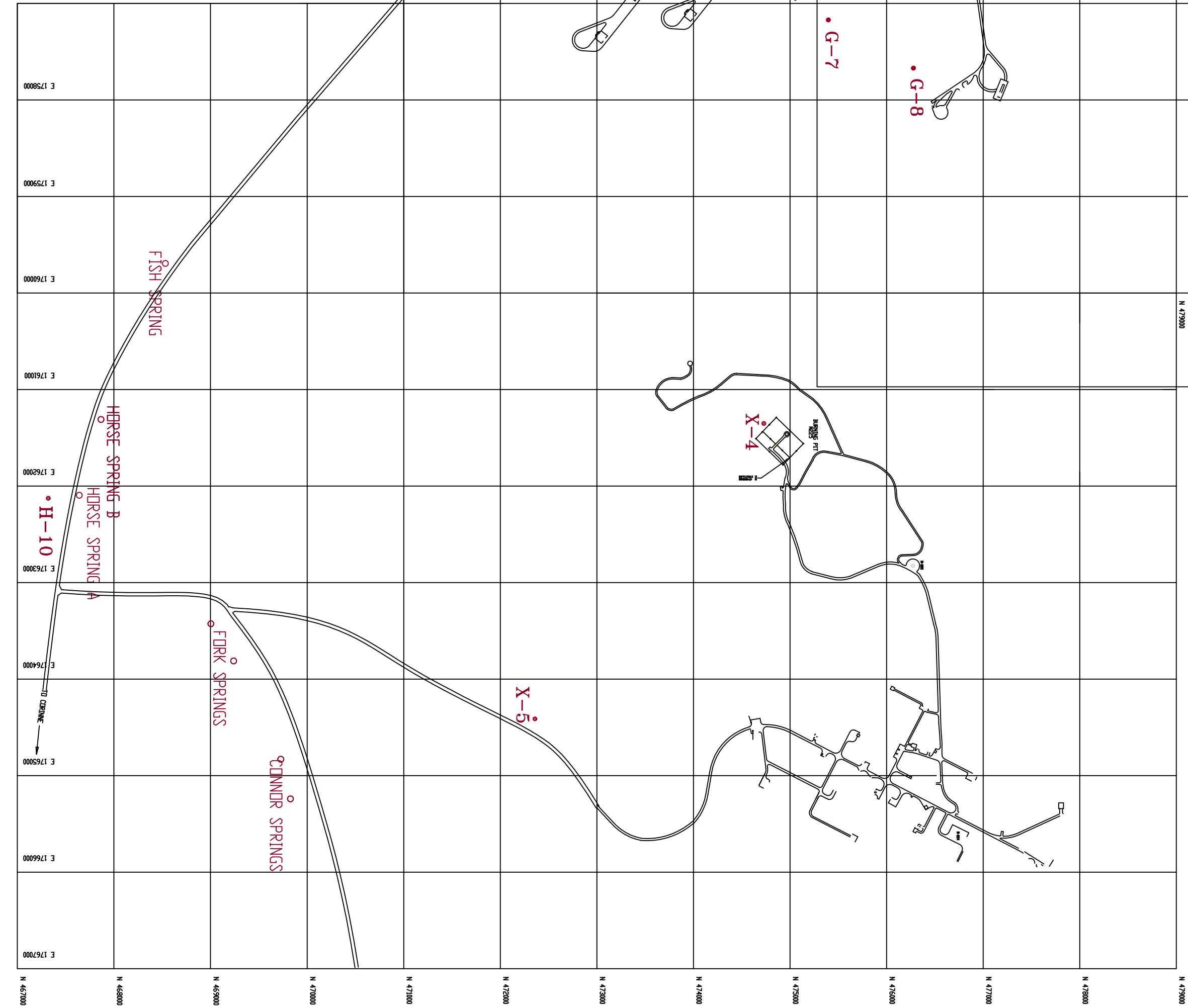
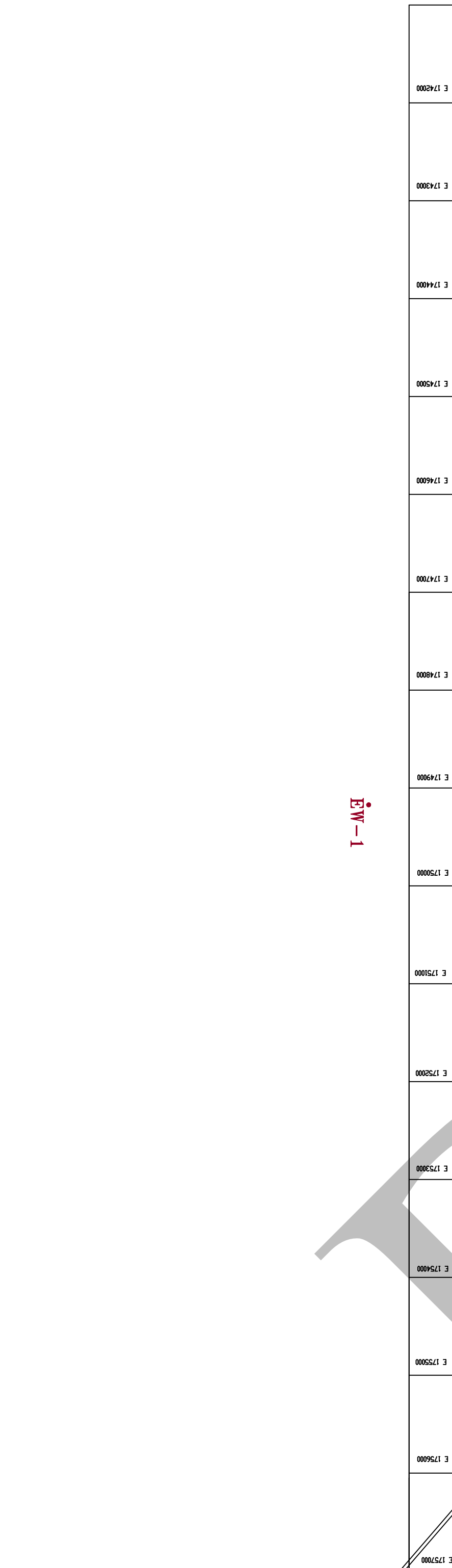
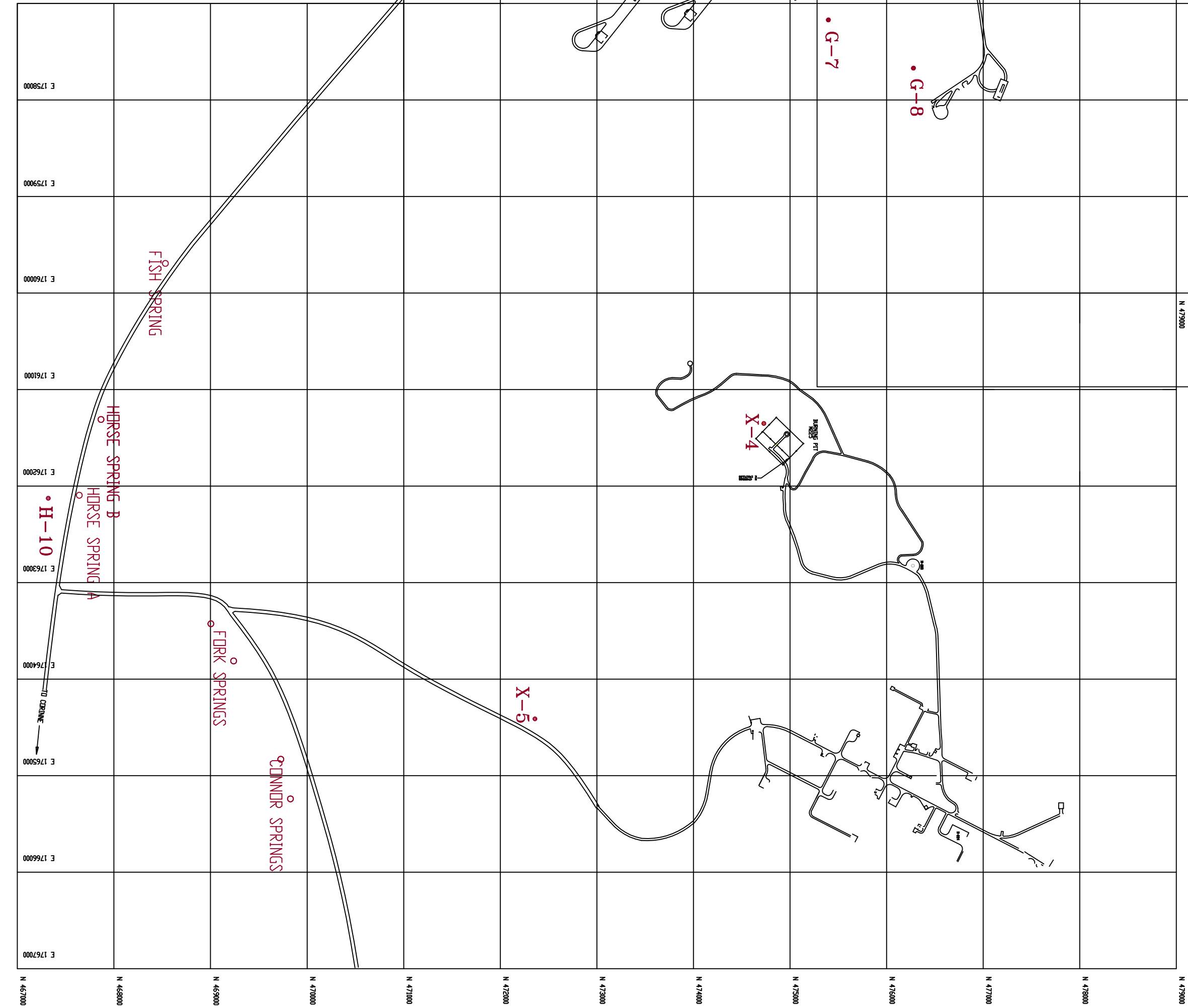
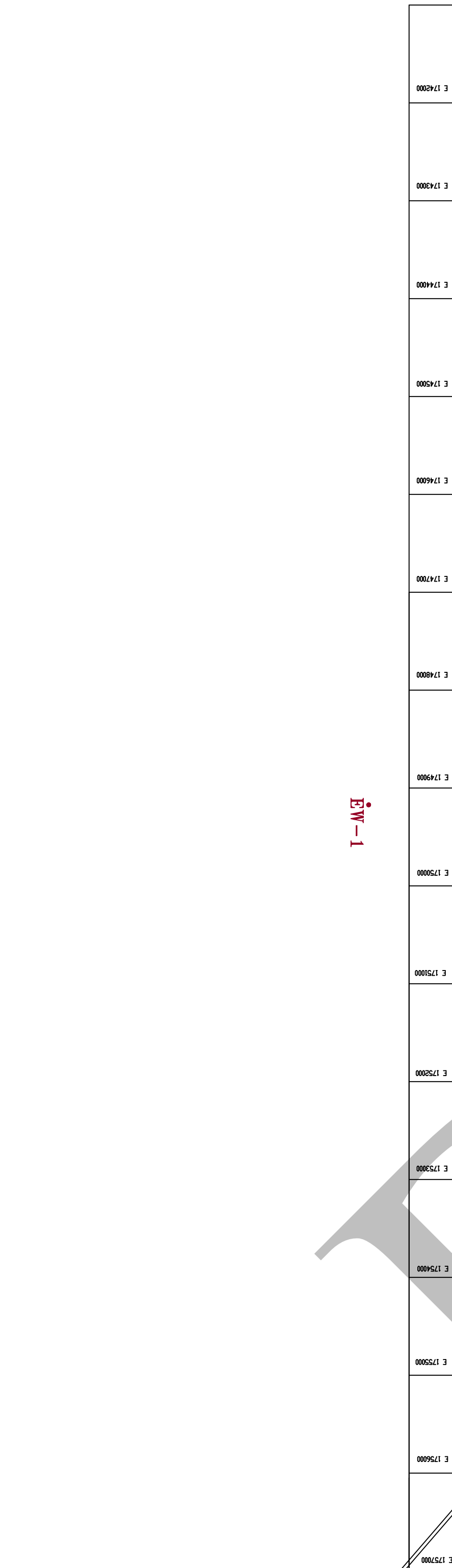
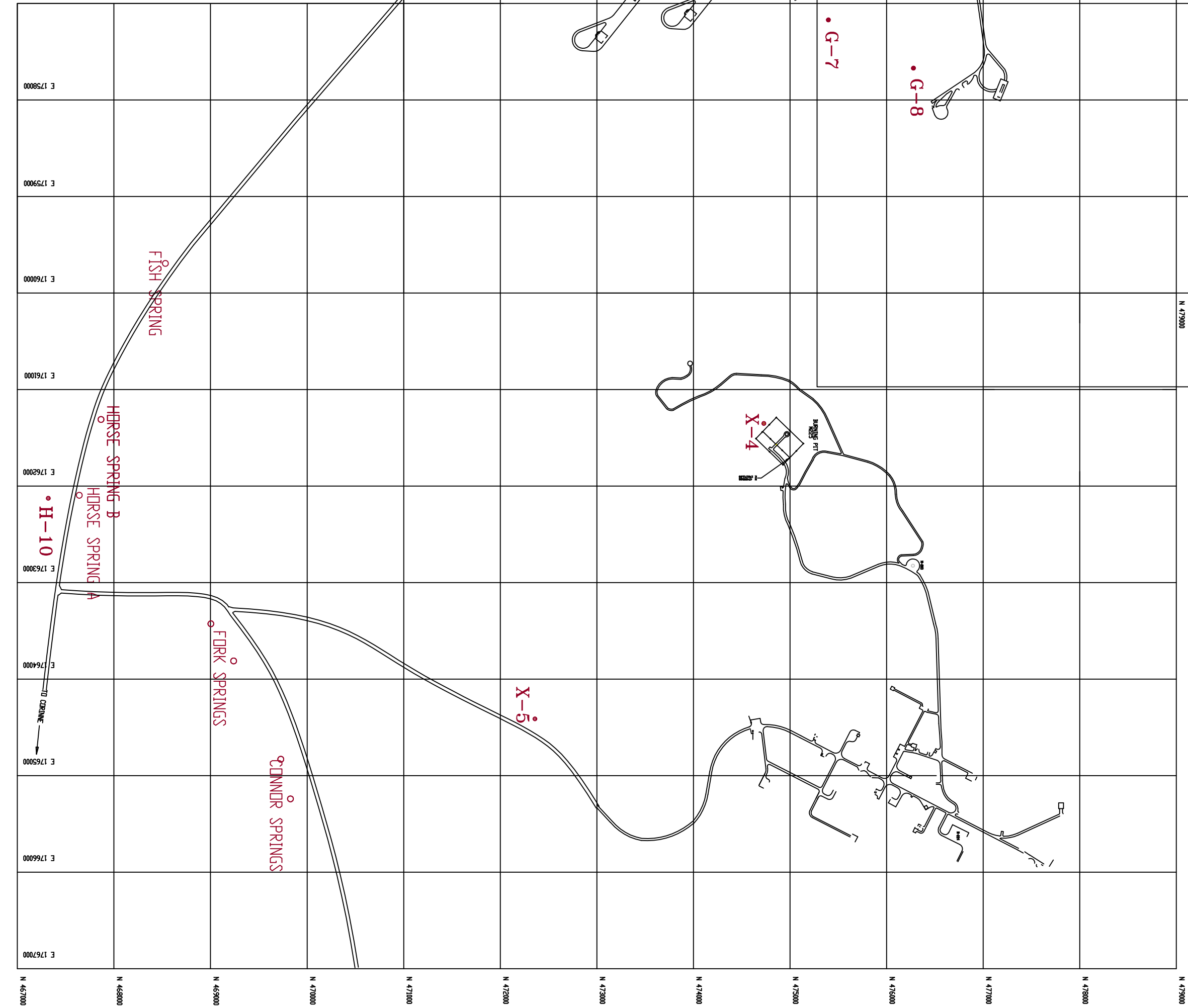
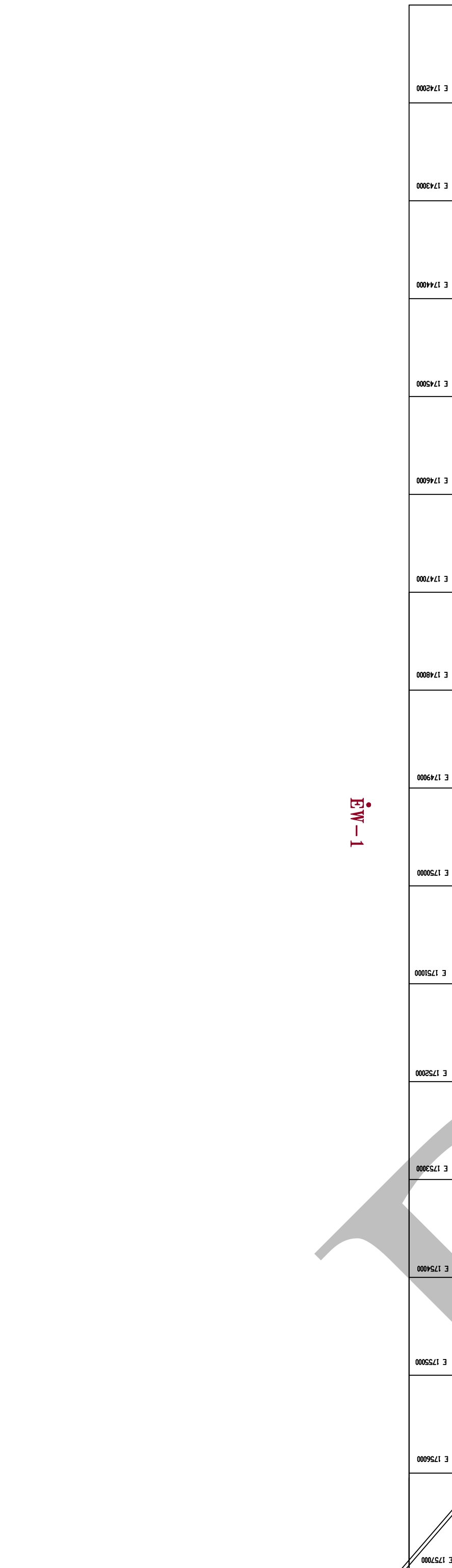
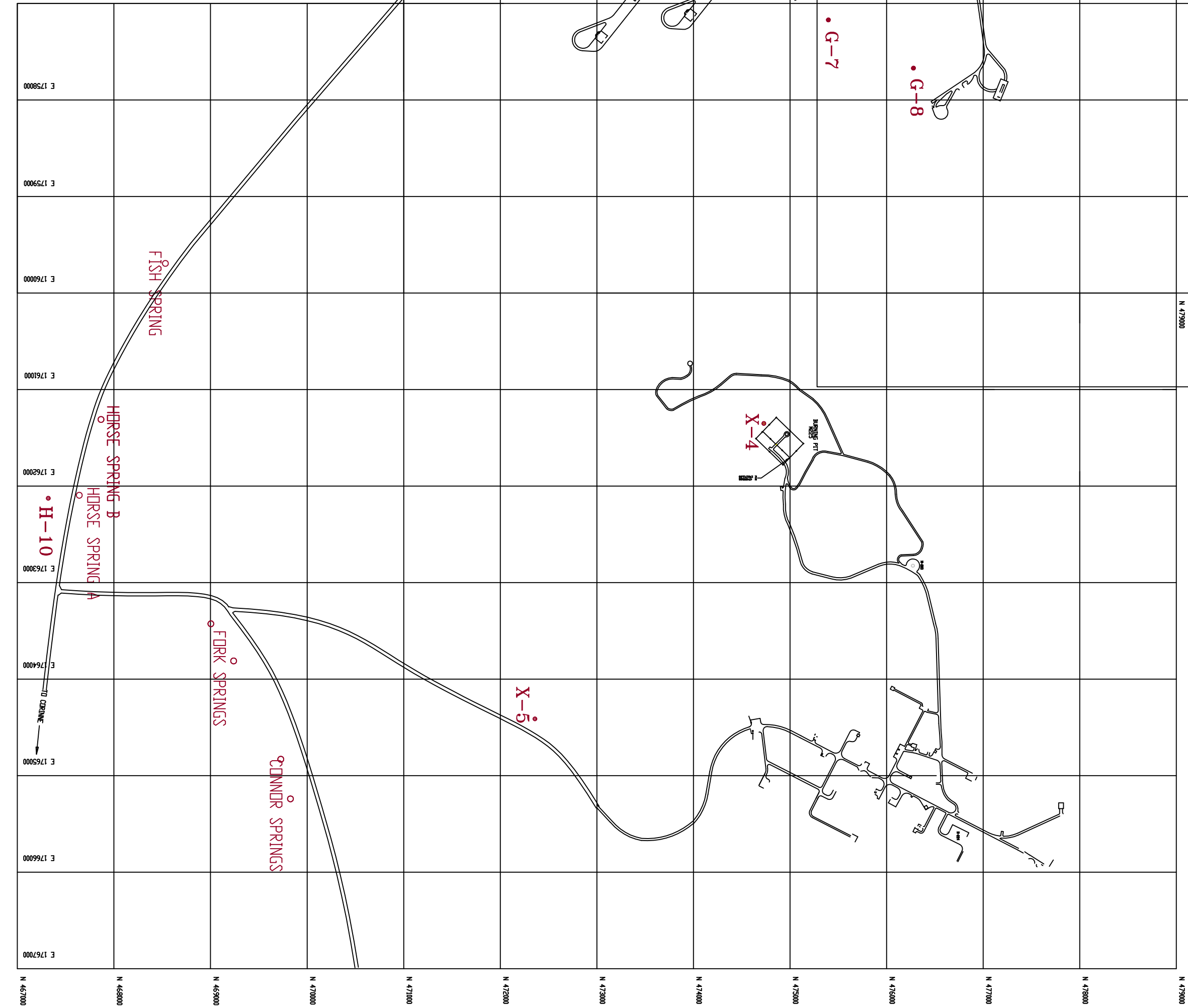
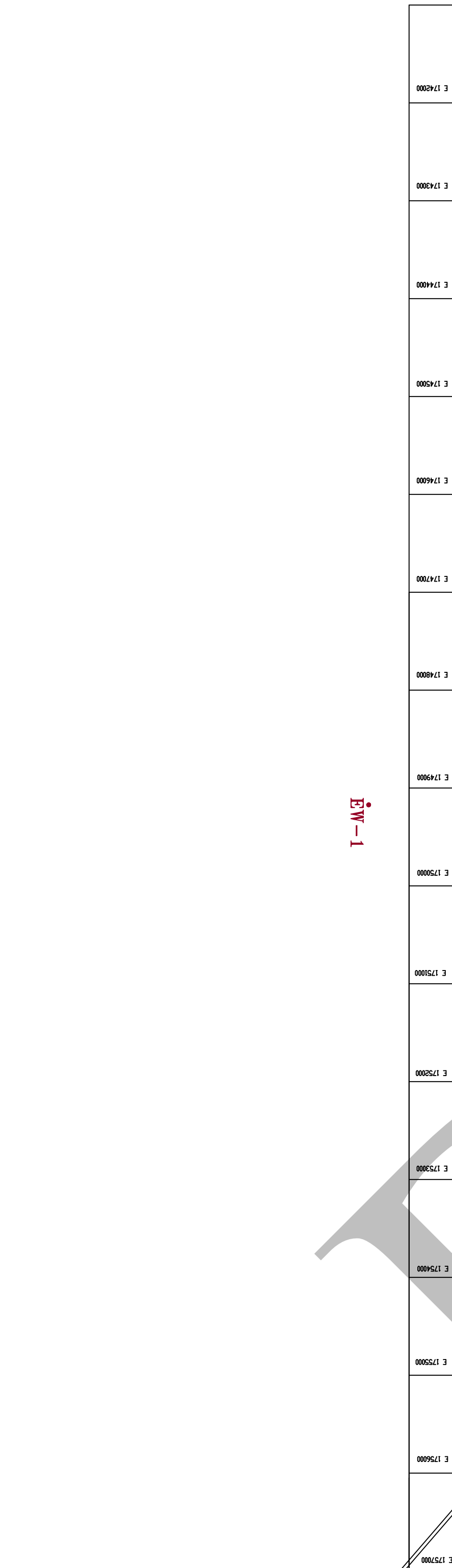
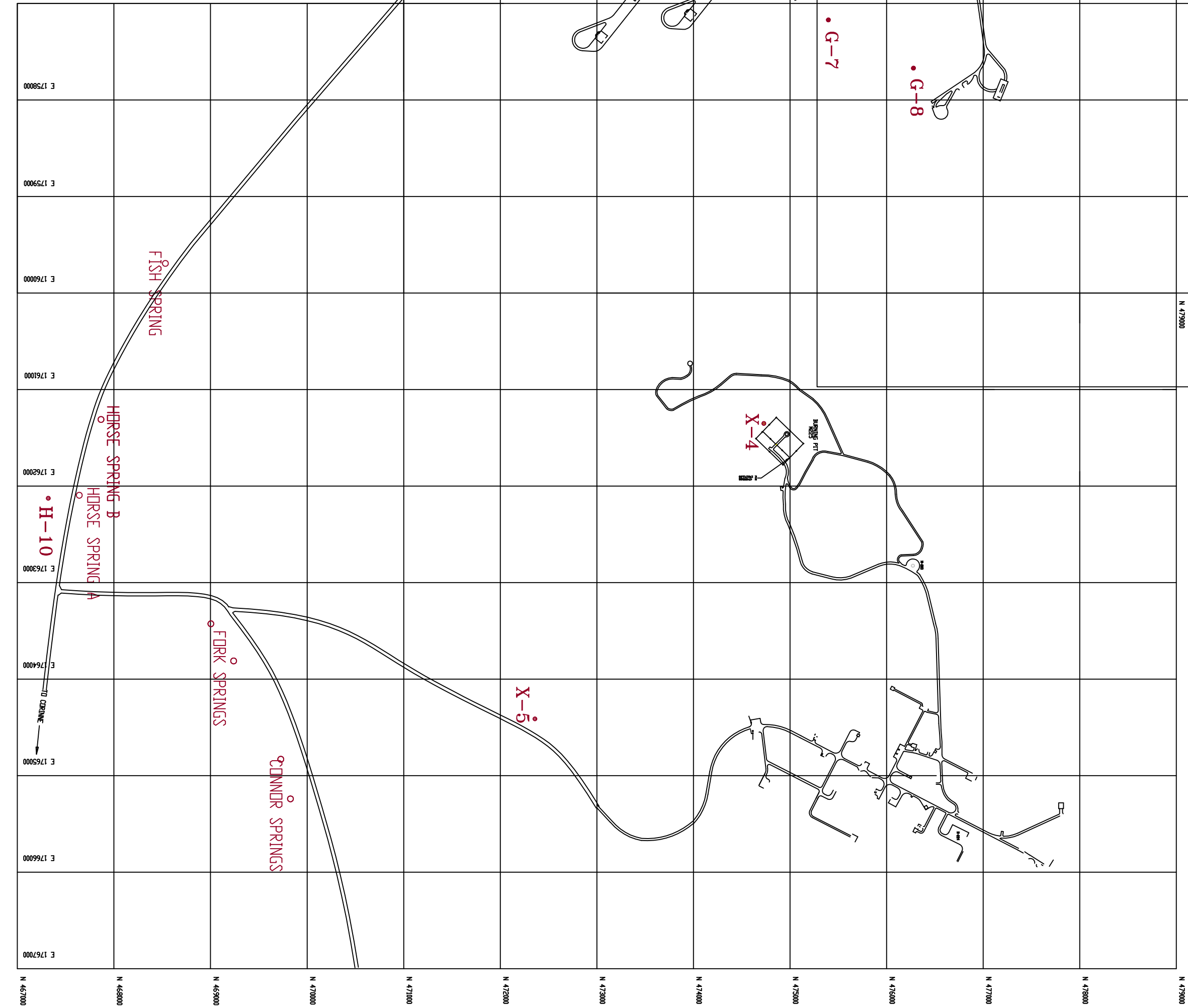
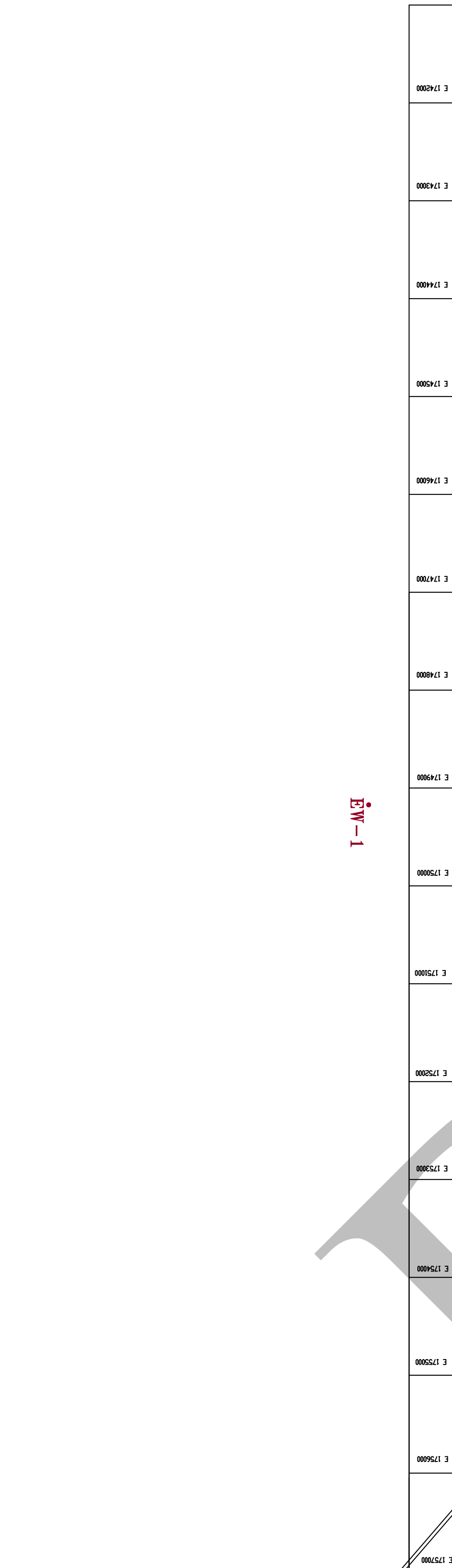
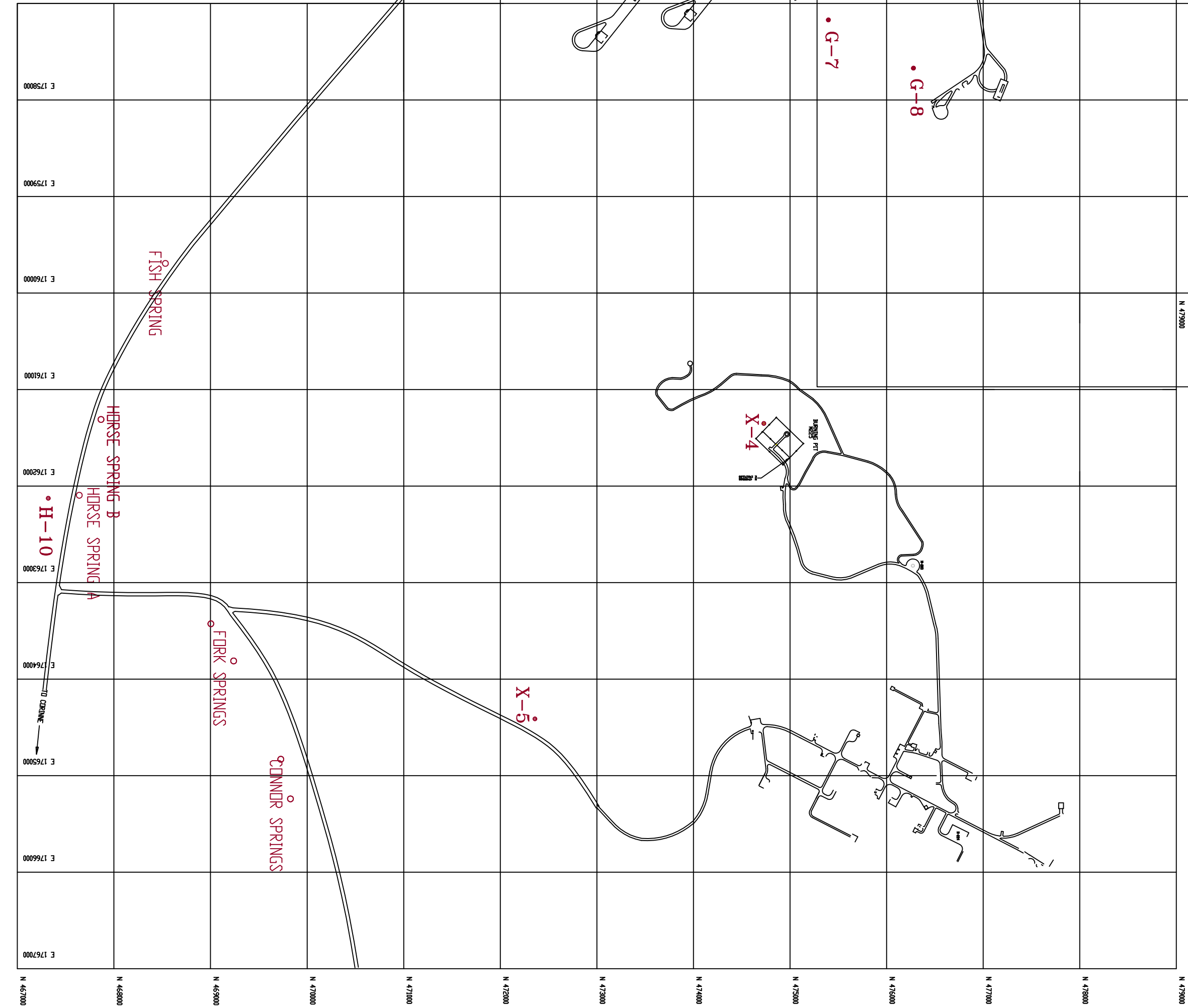
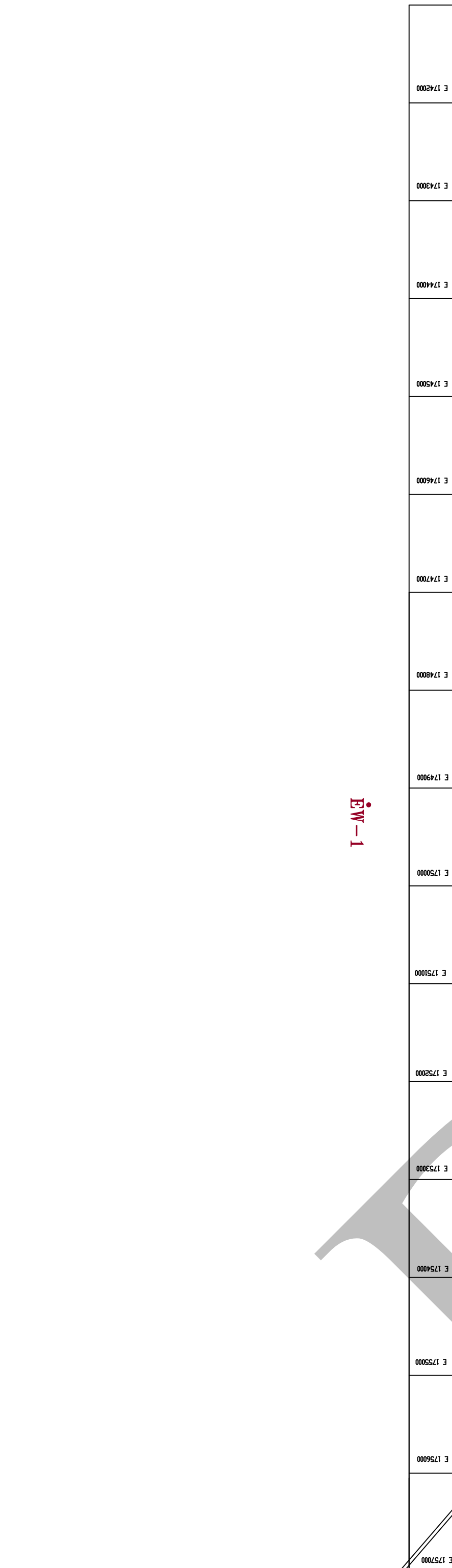
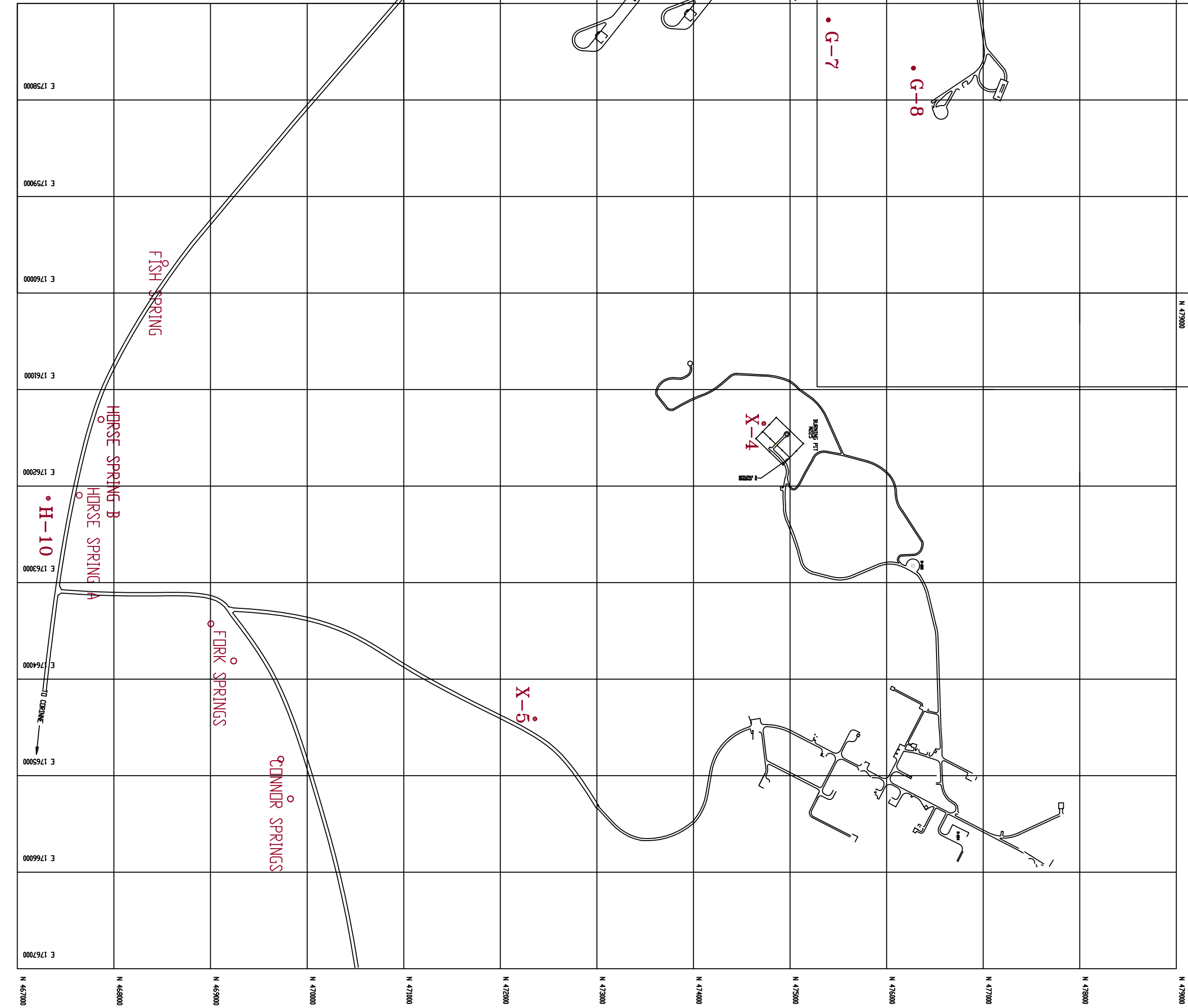
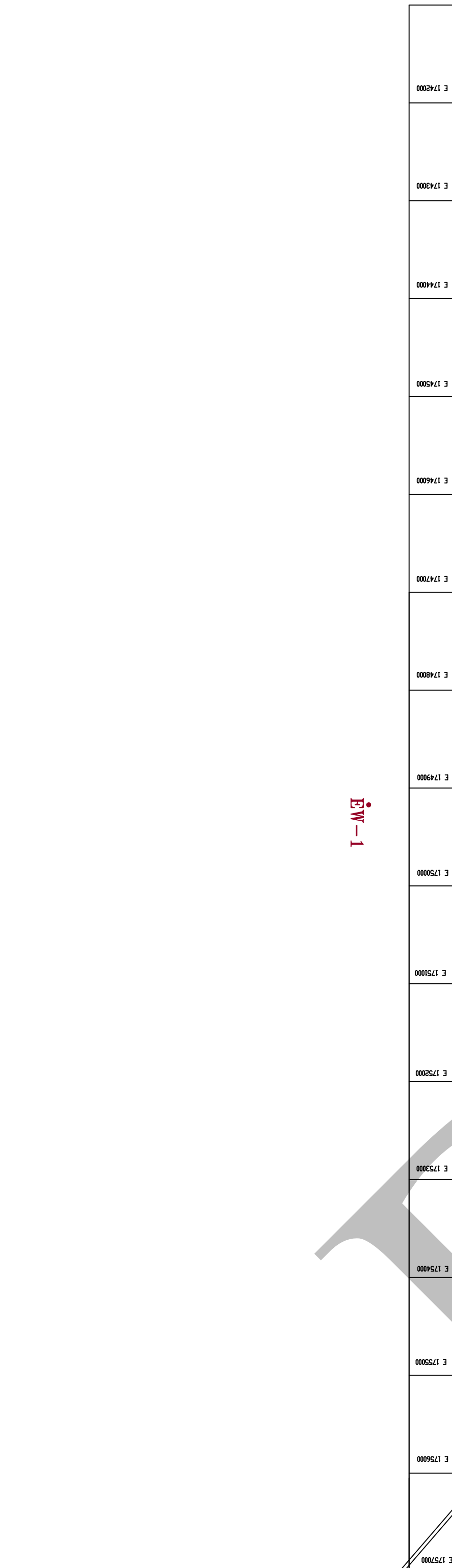
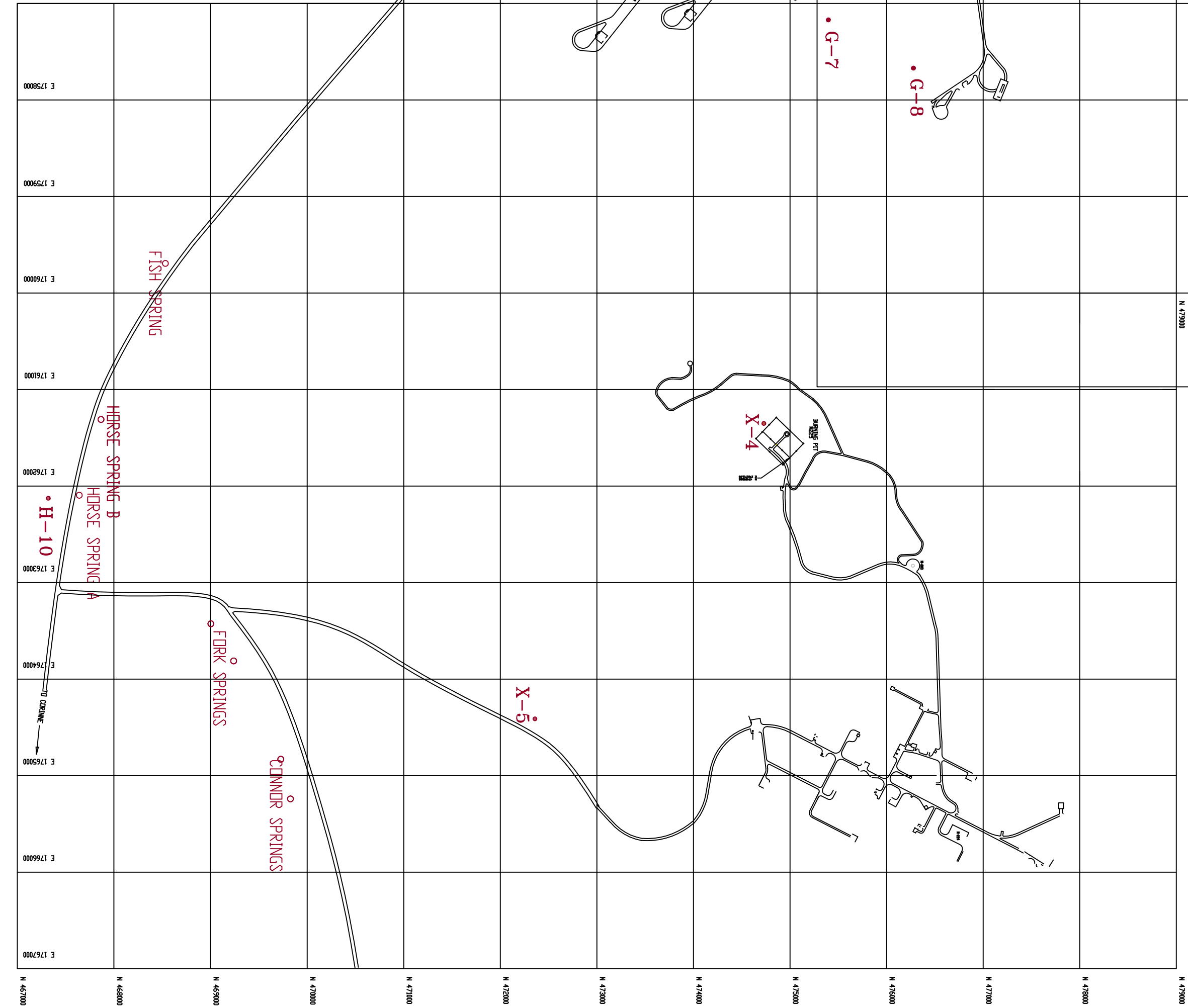
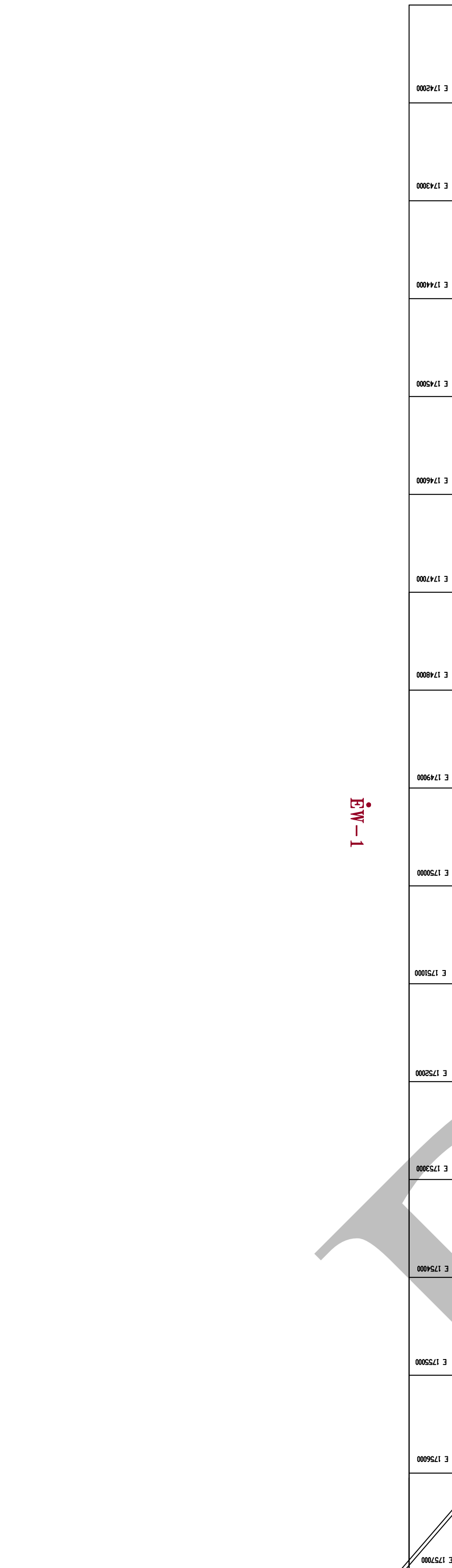
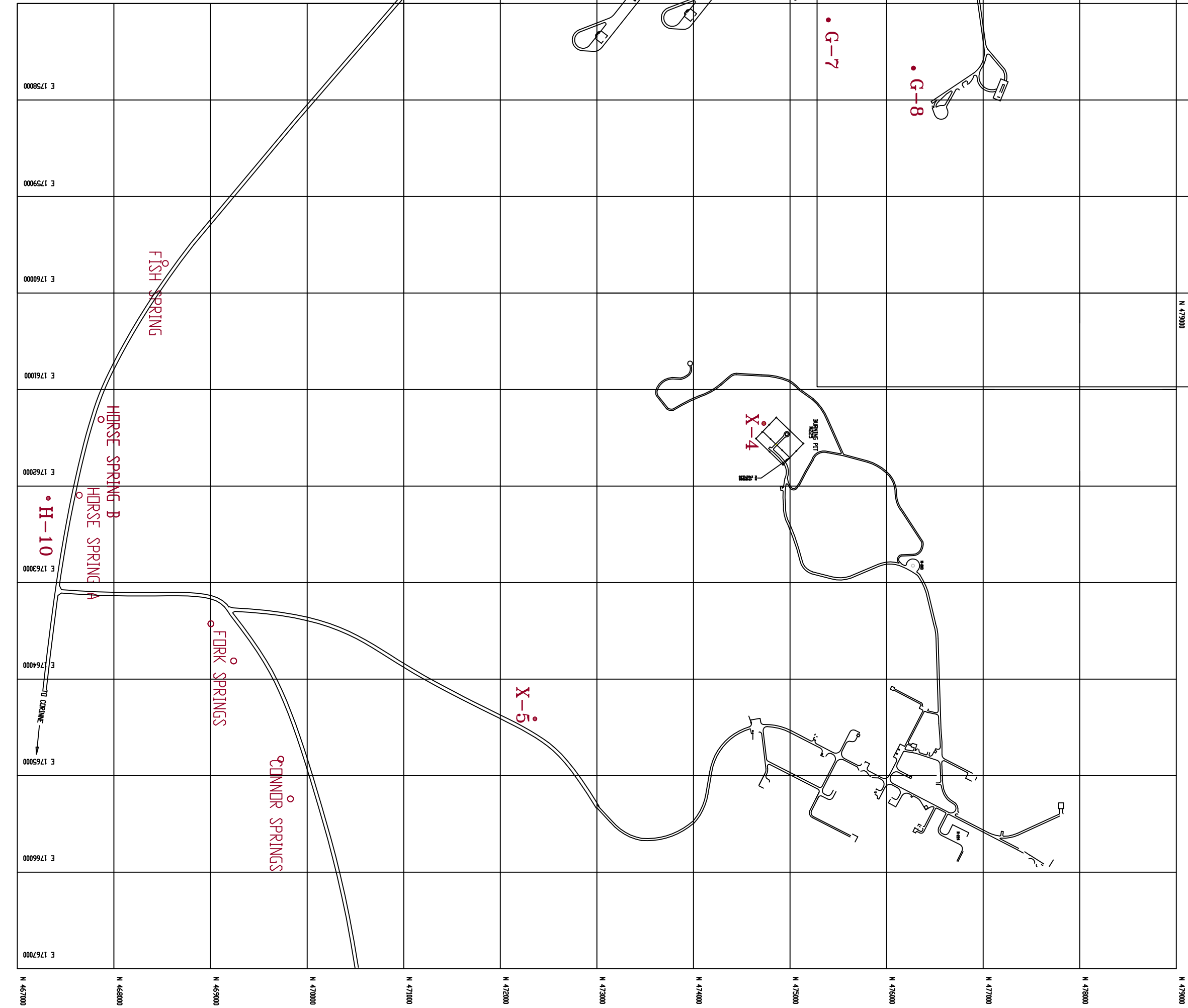
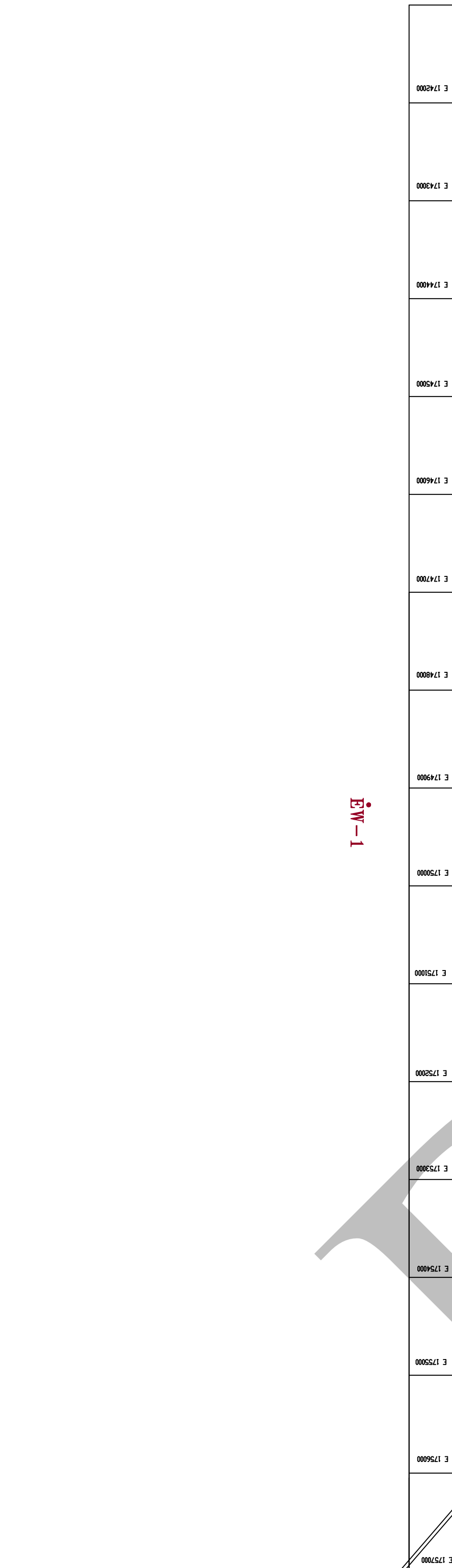
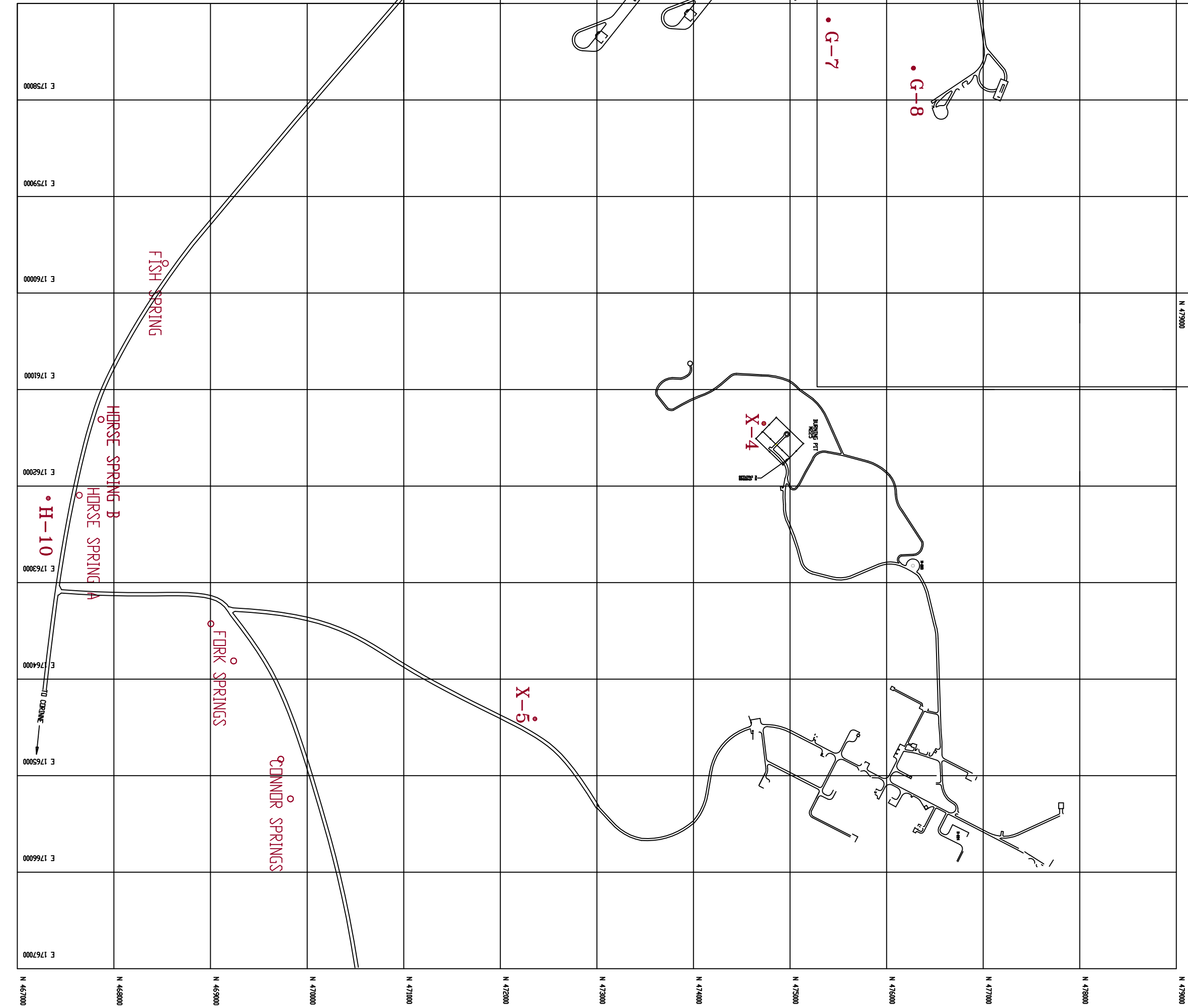
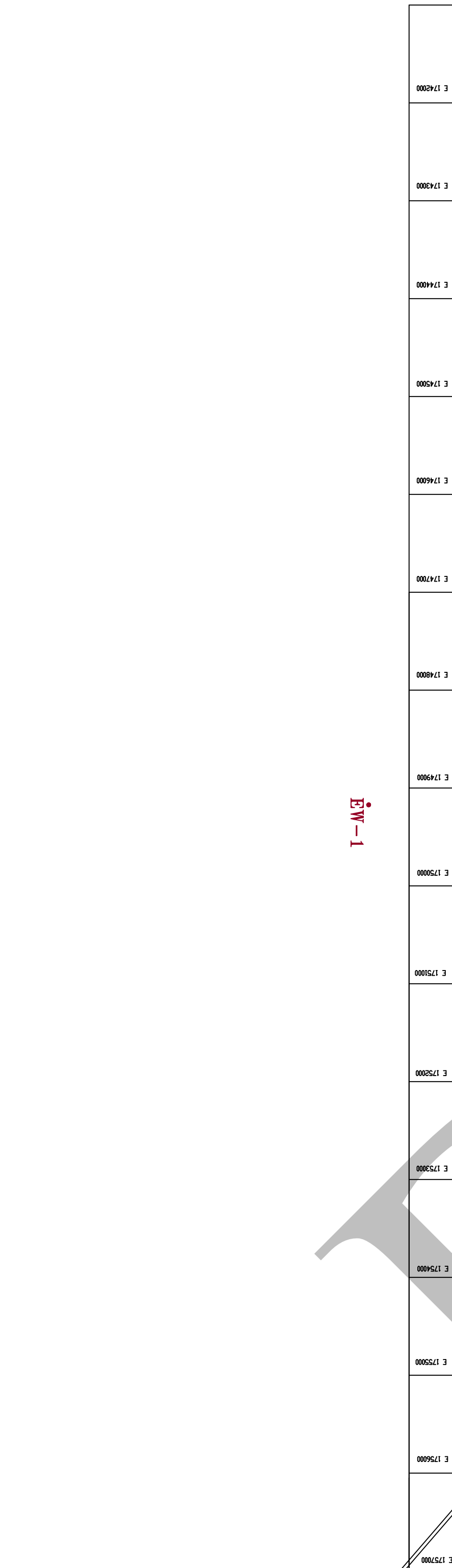
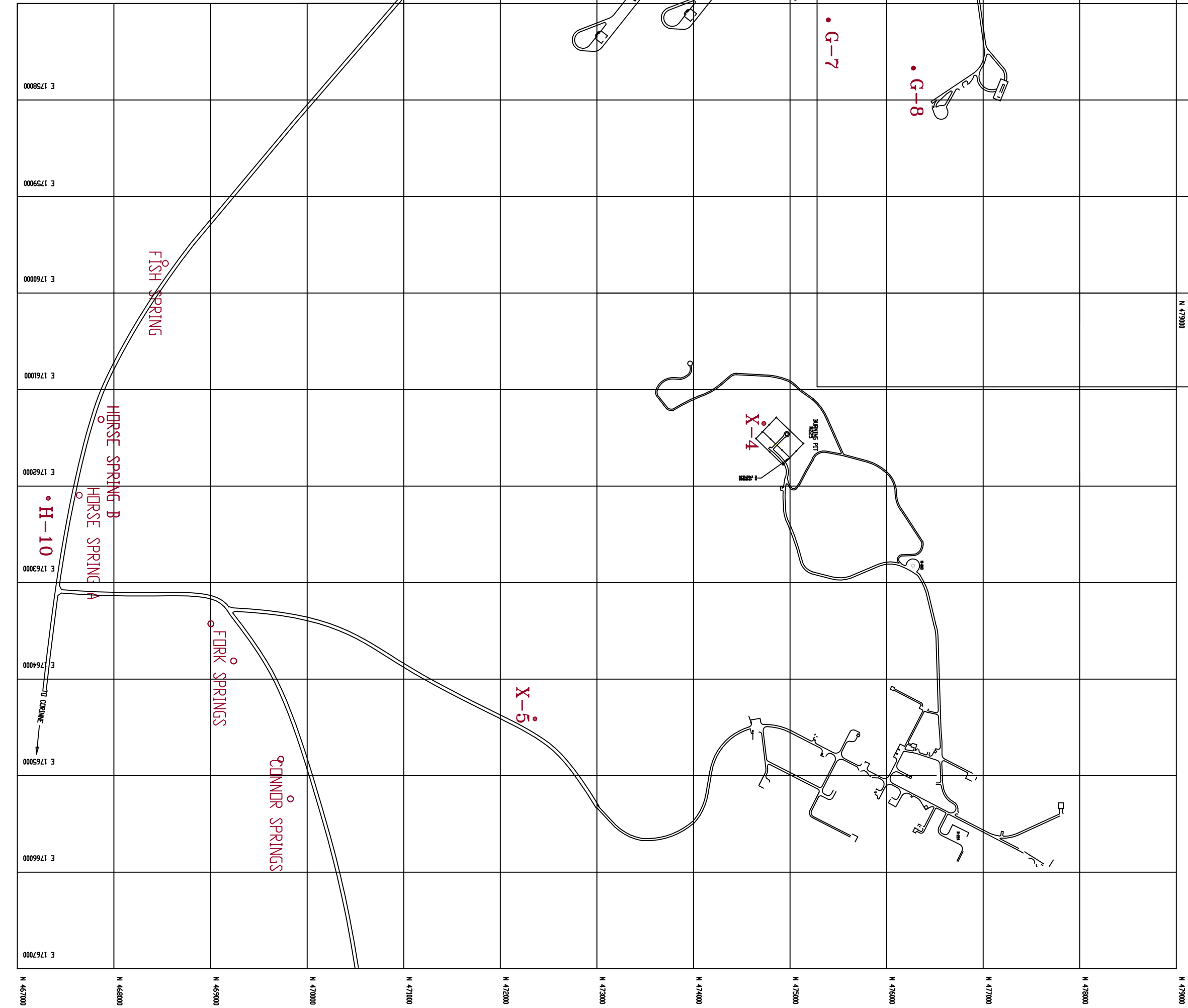
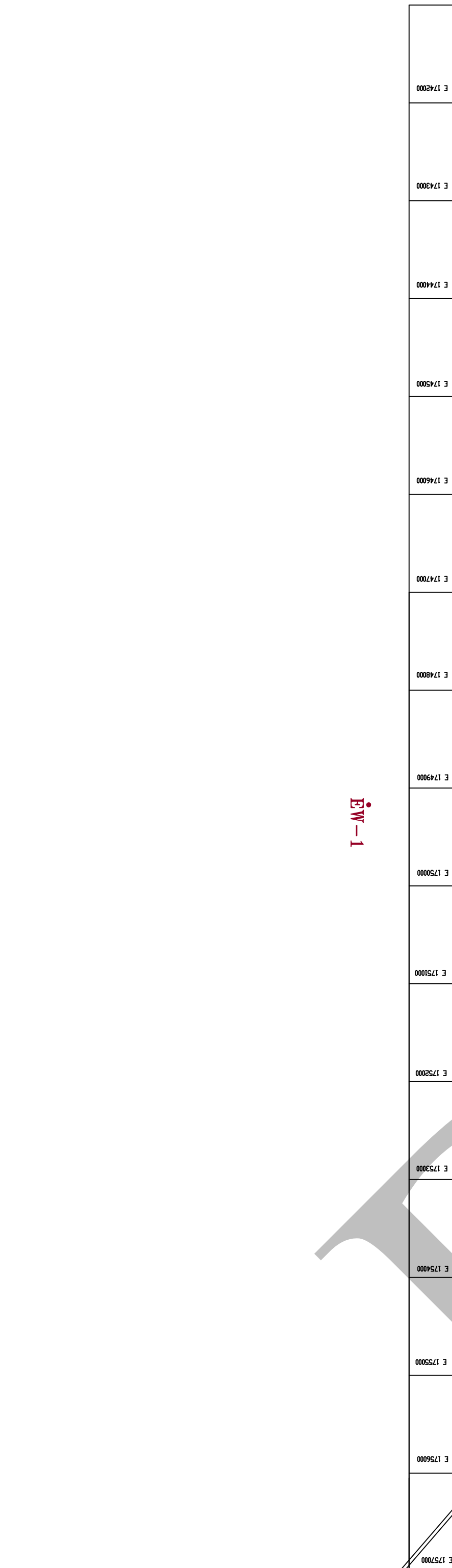
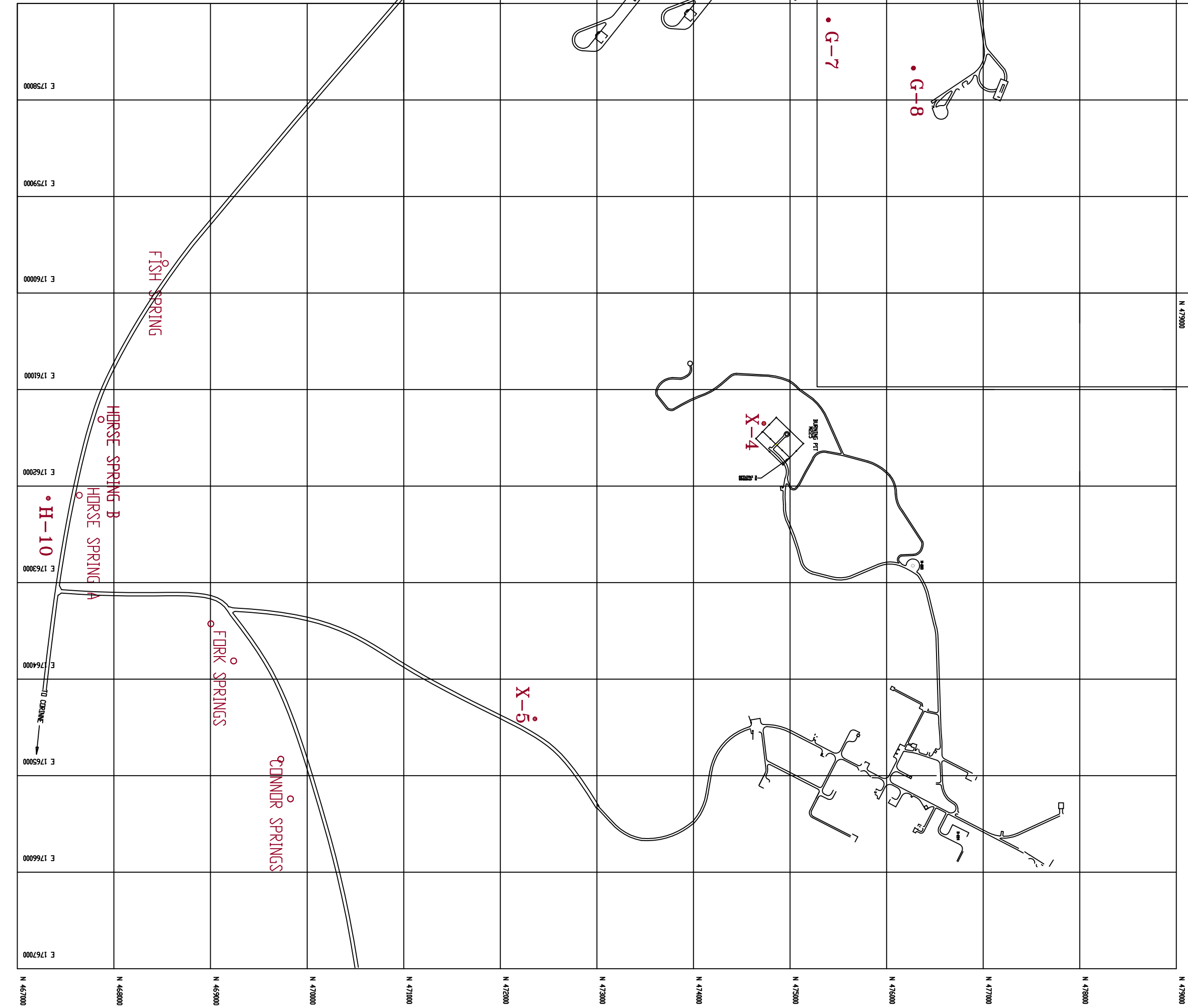
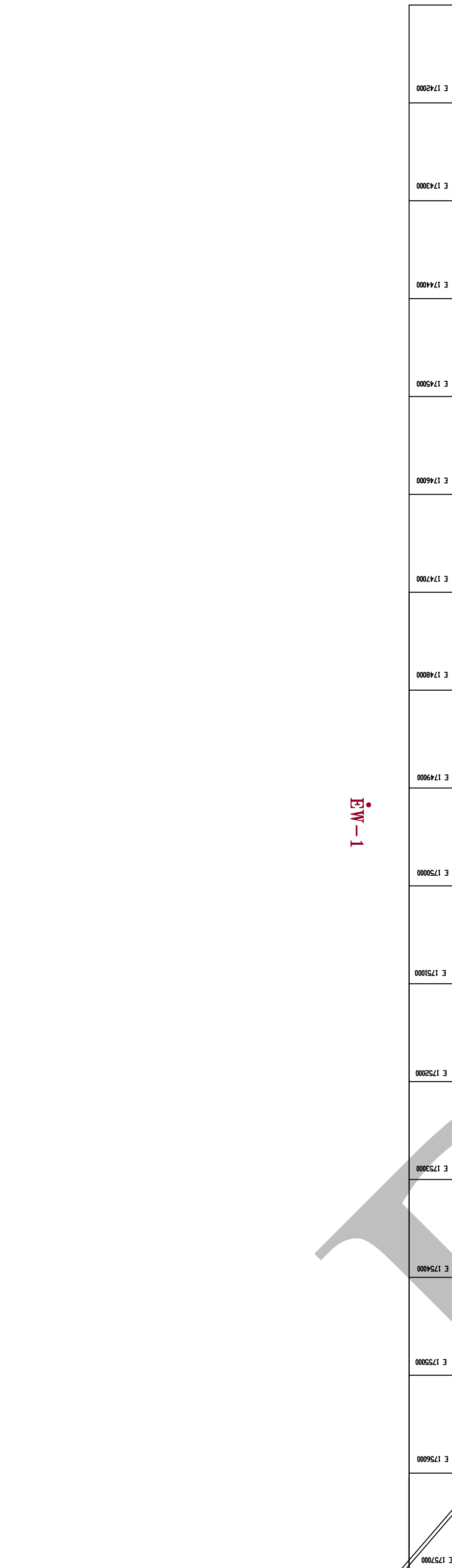
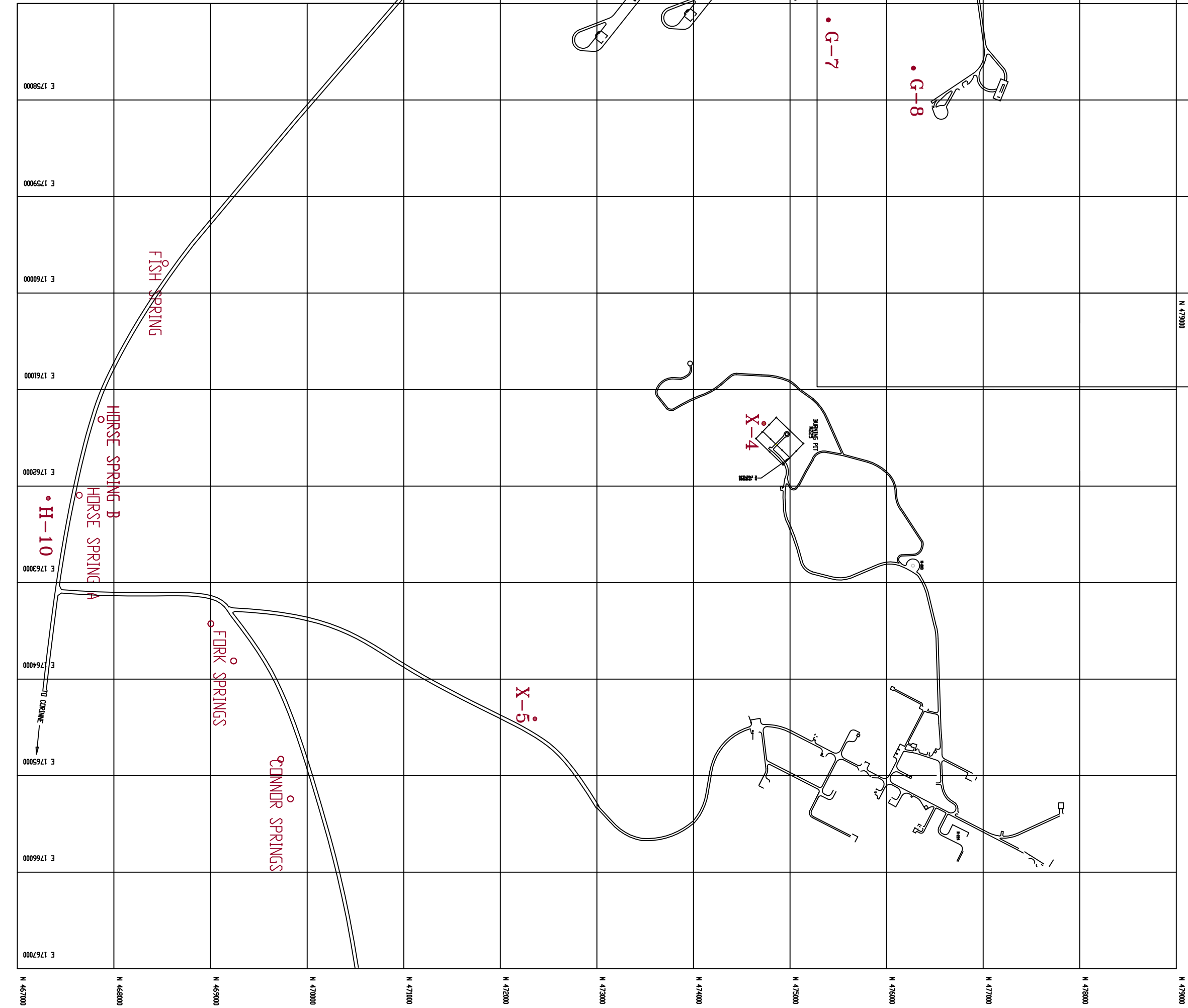
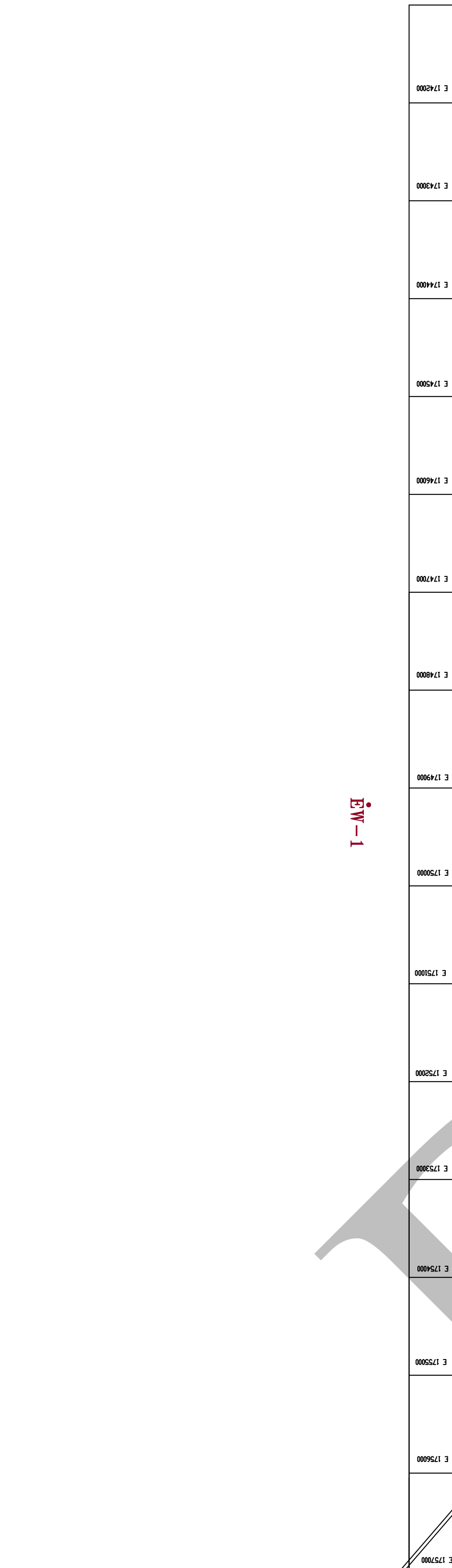
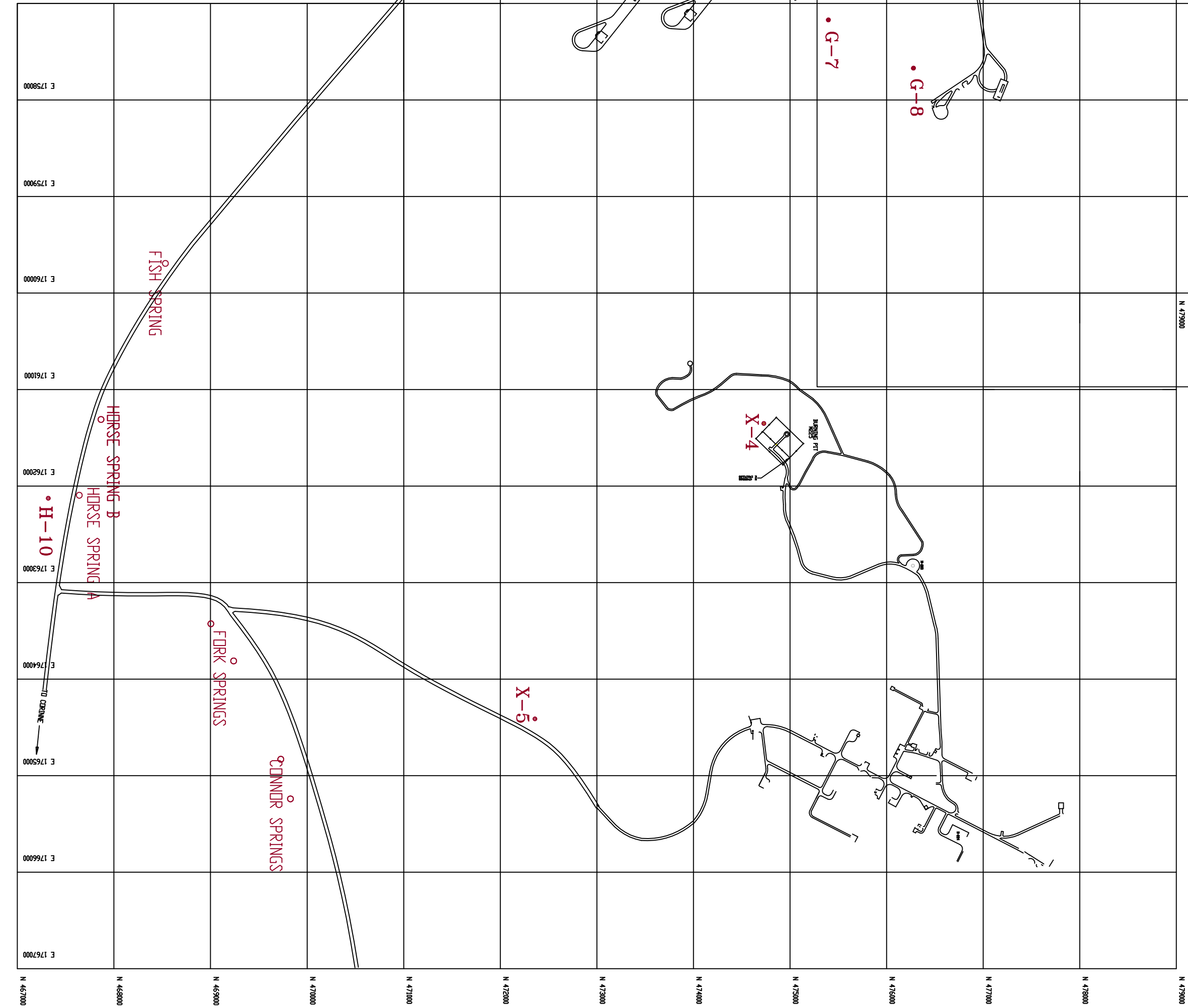


MATCH LINE  
CONT. HOJAY



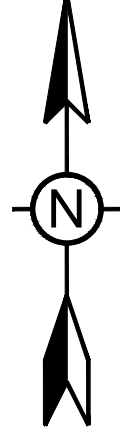
H-5

BW-1





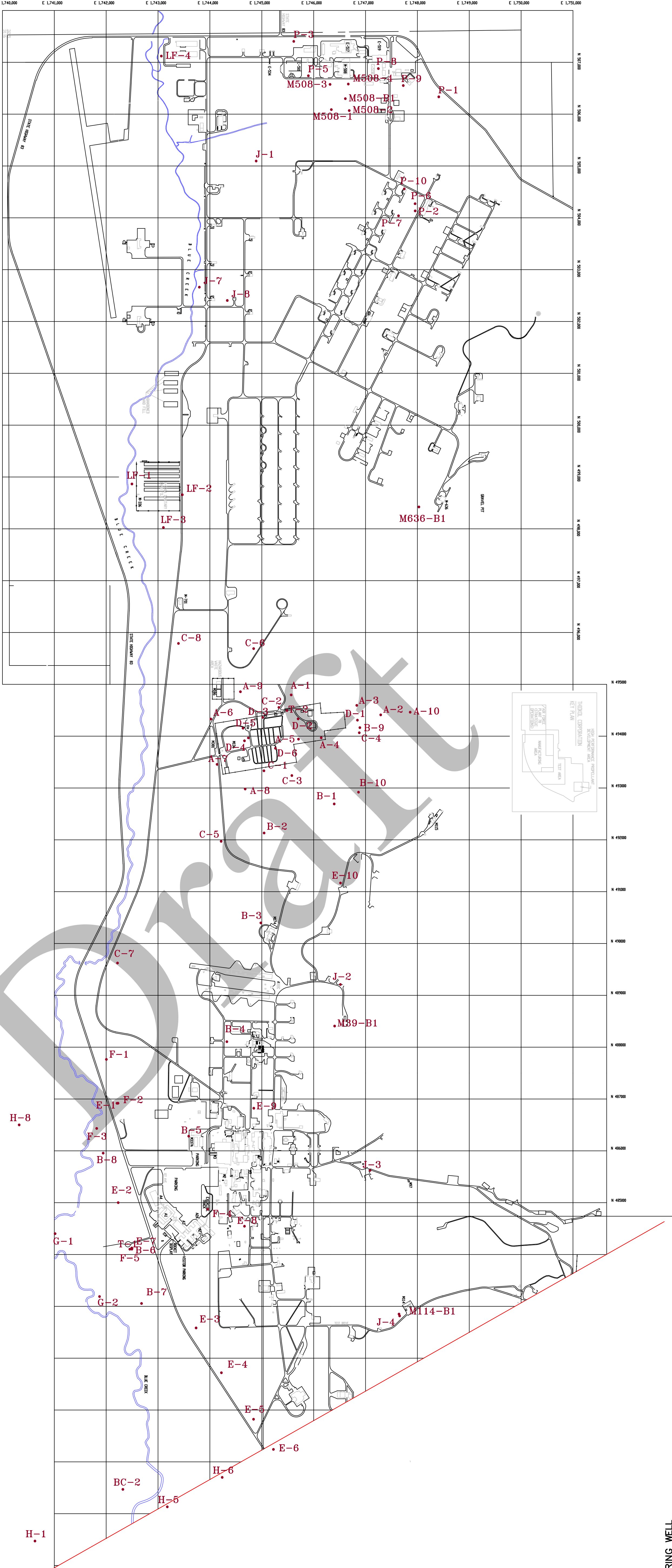
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MATCH LINE  
ENTR HOLTN

BC-3

H-1  
H-2  
H-3  
H-4  
H-7  
H-8



LEGEND

• A-10 GROUNDWATER MONITORING WELL



EarthFax Engineering Group LLC  
Engineers/Scientists

0' 1000'

BASE MAP:

REVISION'S

DATE	BY	DATE	BY

DRAWN BY: KHB  
APPROVED BY: PVH

CHECKED BY: PVH

MARCH 2017



Orbital ATK  
P.O. Box 707  
Birmingham, Utah 84302

PLATE 1B  
WELL LOCATION MAP

## **Monitoring Well Completion Report Requirements**

### **Introduction**

The Monitoring Well Completion Report requirements that are addressed in this attachment are based on the EPA RCRA Groundwater Monitoring Technical Enforcement Guidance Document (OSWER-9950.1, November 1992), and subsequent addenda. The Monitoring Well Completion Reports shall, at a minimum, consist of the four following components:

1. A boring log that documents well drilling and associated sampling;
2. A well construction log and well construction diagram (“as built”);
3. Well survey information for locations and elevations of the newly completed wells, with a map showing the well locations, and
4. A summary that discusses how the groundwater flow model shall be updated based on the data obtained from the installation of the new wells.

The detailed information that shall be included for each of the four components is outlined below.

### **Additional Information**

In addition to the four main components, the Well Completion Reports shall include a description of the purpose of the new wells (e.g. definition of the extent of groundwater contamination plumes) and a discussion on deviations from the Monitoring Well Installation Plan.

In addition, Monitoring Well Completion Reports shall include sections on geology and hydrogeology. Well Completion Reports submitted by Thiokol in the past have included cross-sections, fence diagrams, and summary discussions on the geology and hydrogeology of the new wells. If pump or slug tests are conducted, the test data should be submitted with calculations for transmissivity, hydraulic conductivity and groundwater flow rates.

### **Boring Logs and Field Records**

Drilling logs and field records should be prepared detailing the following information:

- The lithology or pedology (i.e., geologic or soil classification) of each geologic and soil unit in the unsaturated and saturated zones, including the confining layer. The classification system used for lithologic and pedologic descriptions should be a system described in the literature, and should be summarized or referenced in the permit application. For example, soils may be described



using the Unified Soil Classification System, and rock may be described using the classification schemes of Dunham (1962) for carbonates, Pettijohn et al. (1972) for sandstones, Potter et al. (1980) for shales, and the common textural and compositional classification schemes for igneous and metamorphic rock (e.g., rhyolite, granite, basalt, schist, slate, marble, gneiss, etc.). Examples of these classifications schemes are presented in Appendix 2;

- Descriptions of the structural features encountered. As applicable, this should include a description of planar features (e.g., bedding planes, graded bedding), lineations, and other features related to vegetation, and discontinuities. The orientation of these features should be measured and described when possible;
- Moisture content (saturated, moist, dry), degree of weathering, color (referenced to standardized colors when possible (e.g., Munsell color for moist soil and unconsolidated materials)), and stain (e.g., presence of mottles,  $\text{Fe}_2\text{O}_3$ ), as applicable;
- If a field monitoring device (e.g., FID, PID) is used, the data from these measurements, including sampling method, background and sample concentrations, probe type, span setting, and calibration gas type and concentration, should be provided to EPA as part of the boring log or field record;
- Depth to the water table;
- Depth to water-bearing unit(s) and vertical extent of each water-bearing unit;
- Depth of borehole and reason for termination of borehole;
- Depth, location, and identification of any evidence of contamination (e.g., odor, staining) encountered in borehole;
- Observations made during drilling (e.g., advance rate, water loss); and
- Observations made during soil, unconsolidated material, or rock sampling (e.g., blow counts, sample recovery).

The subsurface boring log should contain at least the information identified with an "X" in the Table below (Aller et al., 1989 provide an example format for a field boring log).

**TABLE 3  
FIELD BORING LOG INFORMATION**

<u>General</u>																																									
<i>x Project (facility) name</i>	<i>x Rig type, bit size/auger size, hammer type</i>																																								
<i>x Hole name/number</i>	<i>x Sampling equipment used</i>																																								
<i>x Date started and finished</i>	<i>x Classification scheme used for soils</i>																																								
<i>x Geologist's name</i>	<i>(e.g., USDA textural classification system, or unified soil classification system)</i>																																								
<i>x Driller's name</i>	<i>x Classification scheme used for rocks</i>																																								
<i>• Sheet number</i>	<i>(see Appendix 2 for examples)</i>																																								
<i>x Hole location; map and elevation (surveyed)</i>																																									
<u>Information Columns</u>																																									
<i>x Depth of borehole</i>	<i>x Percent sample recovery</i>																																								
<i>x Sample depth/number/type</i>	<i>x Narrative description</i>																																								
<i>x Blow counts and advance rate</i>	<i>x Depth to saturation (nearest 0.01 foot)</i>																																								
<u>Narrative Description</u>																																									
<ul style="list-style-type: none"> <li>Geologic Observations (include depth, description):           <table border="0"> <tr> <td><i>x soil/unconsolidated material/rock type</i></td> <td><i>x fractures</i></td> <td><i>x sedimentary structures</i></td> </tr> <tr> <td><i>x color and stain</i></td> <td><i>x solution cavities</i></td> <td><i>x presence of organic matter</i></td> </tr> <tr> <td><i>x texture</i></td> <td><i>x bedding, formation boundaries</i></td> <td><i>x odor</i></td> </tr> <tr> <td><i>x gross petrology</i></td> <td><i>x discontinuities: e.g., foliation</i></td> <td><i>x suspected contaminants</i></td> </tr> <tr> <td><i>• friability</i></td> <td><i>x water-bearing zones</i></td> <td></td> </tr> <tr> <td><i>x moisture content</i></td> <td><i>x dip of bedding, foliations, etc.</i></td> <td></td> </tr> <tr> <td><i>x degree of weathering</i></td> <td><i>• fossils, with a taxonomic identification (i.e., brachiopod, trilobite, etc.)</i></td> <td></td> </tr> <tr> <td><i>x presence of carbonate minerals</i></td> <td></td> <td></td> </tr> </table> </li> <li>Drilling Observations:           <table border="0"> <tr> <td><i>x loss of circulation</i></td> <td><i>x changes in drilling method or equipment</i></td> <td><i>x amounts and types of any drilling fluids used</i></td> </tr> <tr> <td><i>x advance rates</i></td> <td><i>x readings from detective equipment, if any</i></td> <td><i>x presence of running sands</i></td> </tr> <tr> <td><i>• rig chatter</i></td> <td><i>x amount of water yield or loss with depth</i></td> <td><i>x caving/hole stability</i></td> </tr> <tr> <td><i>x depth to water table or saturation</i></td> <td></td> <td><i>x reason for termination of borehole</i></td> </tr> <tr> <td><i>x drilling difficulties</i></td> <td></td> <td></td> </tr> </table> </li> <li>Other Remarks:           <ul style="list-style-type: none"> <li>equipment failures</li> <li>possible contamination of soil/groundwater</li> <li>deviations from drilling plan</li> <li>weather</li> </ul> </li> </ul>			<i>x soil/unconsolidated material/rock type</i>	<i>x fractures</i>	<i>x sedimentary structures</i>	<i>x color and stain</i>	<i>x solution cavities</i>	<i>x presence of organic matter</i>	<i>x texture</i>	<i>x bedding, formation boundaries</i>	<i>x odor</i>	<i>x gross petrology</i>	<i>x discontinuities: e.g., foliation</i>	<i>x suspected contaminants</i>	<i>• friability</i>	<i>x water-bearing zones</i>		<i>x moisture content</i>	<i>x dip of bedding, foliations, etc.</i>		<i>x degree of weathering</i>	<i>• fossils, with a taxonomic identification (i.e., brachiopod, trilobite, etc.)</i>		<i>x presence of carbonate minerals</i>			<i>x loss of circulation</i>	<i>x changes in drilling method or equipment</i>	<i>x amounts and types of any drilling fluids used</i>	<i>x advance rates</i>	<i>x readings from detective equipment, if any</i>	<i>x presence of running sands</i>	<i>• rig chatter</i>	<i>x amount of water yield or loss with depth</i>	<i>x caving/hole stability</i>	<i>x depth to water table or saturation</i>		<i>x reason for termination of borehole</i>	<i>x drilling difficulties</i>		
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<i>• friability</i>	<i>x water-bearing zones</i>																																								
<i>x moisture content</i>	<i>x dip of bedding, foliations, etc.</i>																																								
<i>x degree of weathering</i>	<i>• fossils, with a taxonomic identification (i.e., brachiopod, trilobite, etc.)</i>																																								
<i>x presence of carbonate minerals</i>																																									
<i>x loss of circulation</i>	<i>x changes in drilling method or equipment</i>	<i>x amounts and types of any drilling fluids used</i>																																							
<i>x advance rates</i>	<i>x readings from detective equipment, if any</i>	<i>x presence of running sands</i>																																							
<i>• rig chatter</i>	<i>x amount of water yield or loss with depth</i>	<i>x caving/hole stability</i>																																							
<i>x depth to water table or saturation</i>		<i>x reason for termination of borehole</i>																																							
<i>x drilling difficulties</i>																																									
<p><i>x Indicates items that the owner/operator should record, at a minimum.</i></p> <p style="text-align: right;">550A-5</p>																																									

### Well Construction Log and Diagram

In accordance with Condition VI.B.5, all documents pertaining to the design, construction, and development of RCRA monitoring wells shall be kept by the Permittee in the facility operating record and submitted as part of the operating permit. The well construction log and well construction diagram should present the following information (including dimensions, as appropriate):

- Well name/number;
- Date/time of well construction;
- Borehole diameter and well casing diameter;
- Well depth ( $\pm 0.1$  ft);
- Casing length;
- Casing materials;
- Casing and screen joint type;
- Screened interval(s);
- Screen materials;
- Screen slot size/design;
- Filter pack material and size;
- Filter pack volume (calculated and actual);
- Filter pack placement method;
- Annular sealant composition;
- Annular seal placement method;
- Annular sealant volume (calculated and actual);
- Surface sealant composition;
- Surface seal placement method;
- Surface sealant volume (calculated and actual);
- Surface seal and well apron design/construction;
- Well development procedure and ground-water turbidity measured at the completion of well development;
- Type and design/construction of protective casing;
- Well cap and lock;

The owner/operator should document that the following well completion activities were performed appropriately:

- Selection of construction materials for the casing and screen;
- Selection of the well diameter, screen length, and screen slot size;
- Selection and emplacement of the appropriate filter pack;
- Selection and emplacement of the annular sealants;
- Providing proper security of the well; and
- Adequately developing the well.

### Monitoring Well Survey Information and Map

- Ground surface elevation ( $\pm 0.01$  ft);
- Survey reference point elevation ( $\pm 0.01$  ft) on well casing;
- Top of monitoring well casing elevation ( $\pm 0.01$  ft);
- Top of protective steel casing elevation ( $\pm 0.01$  ft); and
- Surveyed well locations; and
- Map showing new monitoring well locations.

### Groundwater Flow Model Update Summary

A summary shall be included that discusses how the groundwater flow model shall be updated based on the data obtained from the installation of the new wells. Examples of the type of information that may be discussed include: presence of contamination (if data is available when report is prepared); geology and hydrology (if not discussed in other sections of the report); potentiometric surface; implications regarding the groundwater flow and transport model; receptors or threats to human health and the environment; etc.

## **TABLE 6-A**

### **ATK Launch Systems - Promontory SWMU Groups**

<b>Group</b>	<b>Description</b>	<b># in Group</b>	<b>Notes</b>
A	Permitted hazardous waste storage	6	
B	Open burning units	36	
C	Photographic waste discharge sites	10	
D	90-day hazardous waste docks	113	Most are NFA Closed
E	Satellite accumulation areas	46	Most are NFA Closed
F	Sumps	105	
G	Landfills, disposal areas	31	
H	Spill sites	11	
I	Hazardous material tanks	18	
J	Historic hazardous waste storage	2	
K	Building discharge to surface	129	
L	Building discharge to subsurface	45	
M	Wastewater impoundments	12	
N	Dust and grit blast collectors	24	
O	Underground storage tanks	3	
P	Mine tailings	2	
Q	Hazardous material storage	5	
R	Paint Booth Overspray Collection	1	
S	Wet Scrubber	1	
T	Fluorescein dye test area	1	
U	Dispersion areas	2	
V	Magnesium grinding area	1	
W	Activated sludge treatment plant	1	

<b>SWMU</b>	<b>Group</b>	<b>Building</b>	<b>SWMU Description</b>	<b>Status</b>
1	A	M-186A	PERMITTED DRUM STORAGE AREA	Active Site
2	A	E-501	PERMITTED DRUM STORAGE AREA	Active Site
021	A	T-029	HYDRAZINE TREATMENT FACILITY	NFA Closed
203	A	M-203	OLD DRUM STORAGE AREA	RFI 2000 Report
295	A	T-029B	HYDRAZINE DILUTION AREA	Active Site
635	A	M-705	HAZ WASTE CONSOLIDATION ROOM	Active Site
003	B	M-136	HIGH ENERGY OPEN BURNING TRENCHES Nos. 16, 17, 18 AND 19	Investigated
004	B	M-136	HIGH ENERGY OPEN BURNING TRENCHES Nos. 14 AND 15	Investigated
005	B	M-136	COMPOSITE OPEN BURNING TRENCHES Nos. 4, 5, 6, AND 7	Investigated
006	B	M-136	ILLUMINANT OPEN BURNING TRENCHES Nos. 3 AND 13	Investigated
007	B	M-136	WASTE SOLVENT PIT #12	Closed with monitoring
008	B	M-136	SOLVENT PIT #11	Closed with monitoring
009	B	M-136	NITRATE PIT #20	Closed with monitoring
010	B	M-136	AP PIT #21	Closed with monitoring
011	B	M-136	HMX TRUCK WASH OUT PIT #22	Closed with monitoring
012	B	M-136	HMX POND #25	Closed with monitoring
013	B	M-136	HMX POND #24	Closed with monitoring
014	B	M-136	HMX POND #23	Closed with monitoring
015	B	M-136	WEST SODIUM AZIDE PIT #26E	Closed with monitoring
016	B	M-136	LOWER SODIUM AZIDE PIT	Closed with monitoring
017	B	M-136	PROPELLANT WASTE WATER PIT #27N	Closed with monitoring
018	B	M-136	PROPELLANT WASTE WATER PIT #27S	Closed with monitoring
019	B	M-225	OPEN BURN AREA	Old sites NFA closed
022	B	M-224	EARTHEN SHOT POND	NFA Closed
195	B	M-174	OLD OPEN BURNING AREA	RFI 2000 Report
201	B	T-035	BERYLLIUM TEST AREA	RFI 2000 Report
202	B	M-243	OLD OPEN BURNING AREA	RFI 2000 Report
207	B	M-136	OLD HMX WASTE WATER PIT	Investigated
233	B	M-067	OLD BURNING GROUNDS TO THE SOUTH	RFI 2000 Report
243	B	M-136	OLD OPEN BURNING AREA	RFI 2000 Report
292	B	M-136	METAL POWDER PITS 1 & 2	Investigated
293	B	M-136	HIGH ENERGY BURN PITS 8, 9, 10 & 11	Investigated
294	B	I-010	BURNING CAGE & FLARE BURNING AREA	NFA Closed
504	B	M-136	SLUDGE BURNING PAN (A)	NFA Closed
505	B	M-136	SLUDGE BURNING PAN (D)	NFA Closed

<b>SWMU</b>	<b>Group</b>	<b>Building</b>	<b>SWMU Description</b>	<b>Status</b>
506	B	M-136	SLUDGE BURNING PAN (B)	NFA Closed
507	B	M-136	SLUDGE BURNING PAN (C)	NFA Closed
546	B	M-136	SLUDGE BURNING PAN (E)	NFA Closed
548	B	T-103	OLD BURNING GROUNDS FOR MINUTEMAN	RFI 2000 Report
556	B	M-136	OLD LTTA LOCATION	
653	B	I-10	Moton Ignitor Burn Tray Area	Voluntary Clean-up
668	B	M-225	DETONATION PIT	RFI 2000 Report
020	C	M-508	OLD PHOTOGRAPHIC WASTE DISCHARGE AREA	Closed with monitoring
023	C	M-114	OLD PHOTOGRAPHIC WASTE DISCHARGE AREA	Closed with monitoring
024	C	M-636	OLD PHOTOGRAPHIC WASTE DISCHARGE AREA	Closed with monitoring
191	C	A-002	OLD PHOTOGRAPHIC WASTE DRAINFIELD	RFI 2000 Report
290	C	M-039	OLD PHOTOGRAPHIC DISCHARGE AREA	NFA Closed
367	C	M-636SW	ACTIVE PHOTOGRAPHIC BUILDING DISCHARGE	Closed with Deed Note
423	C	M-508	INACTIVE PHOTOGRAPHIC DISCHARGE AREA	Closed with monitoring
553	C	M-019A	OLD PHOTOGRAPHIC PROCESSING DISCHARGE AREA	RFI 2000 Report
560	C	A-002	PHOTO DEVELOPER AND RINSE DISCHARGE	RFI 2000 Report
648	C	T-001	SEPTIC SYSTEM RECEIVING PHOTOGRAPHIC SOLUTION	RFI 2000 Report
025	D	M-056	OLD WASTE DOCK LOCATION	NFA Closed
026	D	M-009B	OLD WASTE DOCK LOCATION	NFA Closed
027	D	M-519	WASTE PROPELLANT DOCK	NFA Closed
028	D	M-523	WASTE PROPELLANT DOCK	NFA Closed
029	D	M-585	WASTE PROPELLANT DOCK	NFA Closed
030	D	M-596/M-597	WASTE PROPELLANT DOCK	NFA Closed
031	D	M-208	WASTE PROPELLANT DOCK	NFA Closed
032	D	M-504	WASTE PROPELLANT DOCK	NFA Closed
033	D	M-621	WASTE PROPELLANT DOCK	NFA Closed
34	D	M-075	WASTE PROPELLANT DOCK	RFI 2016
035	D	M-013	WASTE PROPELLANT DOCK	NFA Closed
036	D	M-606	WASTE PROPELLANT DOCK	NFA Closed
037	D	M-218	OLD WASTE DOCK LOCATION	NFA Closed
038	D	M-125/M-126	WASTE PROPELLANT DOCK	NFA Closed
039	D	M-012	OLD WASTE DOCK LOCATION	NFA Closed
040	D	M-629	WASTE PROPELLANT DOCK	NFA Closed
041	D	M-120	WASTE PROPELLANT DOCK	NFA Closed
042	D	I-010	WASTE PROPELLANT DOCK	NFA Closed

<b>SWMU</b>	<b>Group</b>	<b>Building</b>	<b>SWMU Description</b>	<b>Status</b>
043	D	M-034	WASTE PROPELLANT DOCK	NFA Closed
044	D	M-628	WASTE PROPELLANT DOCK	NFA Closed
046	D	M-020	OLD WASTE DOCK LOCATION	NFA Closed
047	D	M-043	WASTE PROPELLANT DOCK	NFA Closed
048	D	M-016	WASTE PROPELLANT DOCK	NFA Closed
049	D	M-027	WASTE PROPELLANT DOCK	NFA Closed
050	D	M-026	WASTE PROPELLANT DOCK	NFA Closed
051	D	M-032	WASTE PROPELLANT DOCK	NFA Closed
052	D	M-053	OLD WASTE PROPELLANT DOCK	NFA Closed
053	D	M-605	WASTE PROPELLANT DOCK	NFA Closed
054	D	M-622	WASTE PROPELLANT DOCK	NFA Closed
055	D	M-623	INACTIVE WASTE DOCK LOCATION	NFA Closed
057	D	M-580	WASTE PROPELLANT DOCK	NFA Closed
058	D	M-524	WASTE PROPELLANT DOCK	NFA Closed
059	D	M-512	WASTE PROPELLANT DOCK	NFA Closed
060	D	M-693	WASTE PROPELLANT DOCK	NFA Closed
061	D	M-694	WASTE PROPELLANT DOCK	NFA Closed
062	D	M-191	WASTE PROPELLANT DOCK	NFA Closed
063	D	M-689	WASTE PROPELLANT DOCK	NFA Closed
064	D	M-309	WASTE PROPELLANT DOCK	NFA Closed
065	D	M-019A	WASTE PROPELLANT DOCK	NFA Closed
066	D	M-076/M-163	WASTE PROPELLANT DOCK	NFA Closed
067	D	M-174	WASTE PROPELLANT DOCK	NFA Closed
069	D	M-594/M-595	WASTE PROPELLANT DOCK	NFA Closed
070	D	M-601	WASTE PROPELLANT DOCK	NFA Closed
71	D	M-602	WASTE PROPELLANT DOCK	NFA Closed
72	D	M-603	WASTE PROPELLANT DOCK	NFA Closed
073	D	M-604	WASTE PROPELLANT DOCK	NFA Closed
074	D	T-021	OLD WASTE PROPELLANT DOCK	NFA Closed
076	D	M-690	WASTE PROPELLANT DOCK	NFA Closed
081	D	M-623	INACTIVE HAZARDOUS WASTE DOCK	NFA Closed
082	D	M-590	90-DAY HAZARDOUS WASTE DOCK	NFA Closed
083	D	M-057A	WASTE PROPELLANT DOCK	NFA Closed
084	D	M-516	OLD HAZARDOUS WASTE DOCK	NFA Closed
085	D	M-629	OLD HAZARDOUS WASTE DOCK	NFA Closed



<b>SWMU</b>	<b>Group</b>	<b>Building</b>	<b>SWMU Description</b>	<b>Status</b>
086	D	M-621	OLD HAZARDOUS WASTE DOCK	NFA Closed
087	D	M-622	OLD HAZARDOUS WASTE DOCK	NFA Closed
088	D	T-014	OLD HAZARDOUS WASTE DOCK LOCATION	NFA Closed
090	D	M-016	90-DAY HAZARDOUS WASTE DOCK (2 DOCKS)	NFA Closed
091	D	M-043	90-DAY HAZARDOUS WASTE DOCK	NFA Closed
092	D	M-179	90-DAY HAZARDOUS WASTE DOCK	NFA Closed
093	D	E-512	90-DAY HAZARDOUS WASTE DOCK	NFA Closed
094	D	M-301	OLD HAZARDOUS WASTE DOCK	NFA Closed
095	D	M-032	OLD HAZARDOUS WASTE DOCK	NFA Closed
96	D	M-111	90-DAY HAZARDOUS WASTE STORAGE	NFA Closed
098	D	M-627	OLD HAZARDOUS WASTE DOCK	NFA Closed
099	D	M-628	90-DAY HAZARDOUS WASTE DOCK	NFA Closed
100	D	M-052	90-DAY HAZARDOUS WASTE STORAGE	NFA Closed
101	D	M-053	90-DAY HAZARDOUS WASTE DOCK	NFA Closed
102	D	M-068	90-DAY HAZARDOUS WASTE DOCK	NFA Closed
104	D	M-508	90-DAY HAZARDOUS WASTE DOCK	NFA Closed
105	D	M-113	90-DAY HAZARDOUS WASTE DOCK	NFA Closed
106	D	E-517	90-DAY HAZARDOUS WASTE DOCK	NFA Closed
108	D	M-010	OLD HAZARDOUS WASTE DOCK	NFA Closed
110	D	M-585	EAST AND SOUTH 90-DAY HAZARDOUS WASTE DOCKS	NFA Closed
300	D	M-241	WASTE PROPELLANT DOCK	NFA Closed
301	D	M-209	WASTE PROPELLANT DOCK	NFA Closed
302	D	T-092	90-DAY HAZARDOUS WASTE DOCK	NFA Closed
303	D	T-001	OLD HAZARDOUS WASTE DOCK	NFA Closed
304	D	T-004C	90-DAY HAZARDOUS WASTE STORAGE DOCK	NFA Closed
305	D	T-004C	WASTE PROPELLANT DOCK	NFA Closed
306	D	T-092	WASTE PROPELLANT DOCK	NFA Closed
315	D	M-689	90-DAY HAZARDOUS WASTE DOCK	NFA Closed
318	D	M-115	HAZARDOUS WASTE DOCK	NFA Closed
329	D	M-019A	90-DAY HAZARDOUS WASTE DOCK	NFA Closed
330	D	T-018	OLD HAZARDOUS WASTE DOCK	NFA Closed
336	D	M-024	OLD HAZARDOUS WASTE DOCK	NFA Closed
339	D	M-076	OLD HAZARDOUS WASTE DOCK	NFA Closed
350	D	M-079	WASTE PROPELLANT DOCK	NFA Closed
482	D	M-197	WASTE PROPELLANT DOCK	NFA Closed

<b>SWMU</b>	<b>Group</b>	<b>Building</b>	<b>SWMU Description</b>	<b>Status</b>
490	D	M-320A	WASTE PROPELLANT DOCK	NFA Closed
512	D	M-193	WASTE PROPELLANT DOCK	NFA Closed
514	D	M-321	90-DAY HAZARDOUS WASTE DOCK	NFA Closed
531	D	M-705	GONDOLA 90-DAY HAZARDOUS WASTE STORAGE	NFA Closed
561	D	M-303	90-DAY HAZARDOUS WASTE DOCK	NFA Closed
563	D	M-079	90-DAY HAZARDOUS WASTE DOCK	NFA Closed
564	D	M-120	90-DAY HAZARDOUS WASTE DOCK	NFA Closed
565	D	M-027	90-DAY HAZARDOUS WASTE DOCK	NFA Closed
566	D	M-512	90-DAY HAZARDOUS WASTE DOCK	NFA Closed
567	D	M-573	90-DAY HAZARDOUS WASTE DOCK	NFA Closed
568	D	S-633	90-DAY HAZARDOUS WASTE DOCK	NFA Closed
569	D	M-224	WASTE PROPELLANT DOCK	NFA Closed
570	D	M-590	WASTE PROPELLANT DOCK	NFA Closed
571	D	M-638	WASTE PROPELLANT DOCK	NFA Closed
576	D	M-137A	90-DAY HAZARDOUS WASTE DOCK	NFA Closed
579	D	A-002	90-DAY HAZARDOUS WASTE STORAGE	NFA Closed
580	D	E-516	90-DAY HAZARDOUS WASTE STORAGE	NFA Closed
581	D	M-191	90-HAZARDOUS WASTE STORAGE	NFA Closed
582	D	M-193	90-HAZARDOUS WASTE STORAGE	NFA Closed
583	D	M-325	90-DAY HAZARDOUS WASTE STORAGE	NFA Closed
584	D	M-593	90-DAY HAZARDOUS WASTE STORAGE	NFA Closed
585	D	M-303	WASTE PROPELLANT DOCK	NFA Closed
586	D	M-354	WASTE PROPELLANT DOCK	RFI 2016
588	D	M-705	WASTE PROPELLANT DOCK	NFA Closed
641	D	M-528	WASTE PROPELLANT DOCK	NFA Closed
089	E	M-209	SATELLITE ACCUMULATION AREA	NFA Closed
97	E	M-605	SATELLITE ACCUMULATION AREA	NFA Closed
103	E	M-504	SATELLITE ACCUMULATION AREA	NFA Closed
107	E	M-066	SATELLITE ACCUMULATION AREA	NFA Closed
109	E	M-002	SATELLITE ACCUMULATION AREA	NFA Closed
309	E	A-002	PALLETAINER SATELLITE ACCUMULATION AREA	NFA Closed
337	E	T-097	SATELLITE ACCUMULATION	NFA Closed
338	E	M-104	SATELLITE ACCUMULATION AREA	NFA Closed
340	E	M-067	SATELLITE ACCUMULATION (8)	NFA Closed
341	E	M-072	SATELLITE ACCUMULATION AREA	NFA Closed

<b>SWMU</b>	<b>Group</b>	<b>Building</b>	<b>SWMU Description</b>	<b>Status</b>
342	E	T-093	SATELLITE ACCUMULATION SITE	NFA Closed
349	E	M-605	SATELLITE ACCUMULATION AREA	NFA Closed
467	E	M-005	SATELLITE ACCUMULATION	NFA Closed
475	E	M-113A	SATELLITE ACCUMULATION	NFA Closed
478	E	M-120	SATELLITE ACCUMULATION AREA	NFA Closed
484	E	M-197	SATELLITE ACCUMULATION AREA	NFA Closed
485	E	M-303	SATELLITE ACCUMULATION	NFA Closed
486	E	M-304	SATELLITE ACCUMULATION	NFA Closed
492	E	T-004	SATELLITE ACCUMULATION AREA	NFA Closed
495	E	T-024	SATELLITE ACCUMULATION	NFA Closed
521	E	M-512	SATELLITE ACCUMULATION	NFA Closed
523	E	M-514	SATELLITE ACCUMULATION AREA	NFA Closed
524	E	M-572	SATELLITE ACCUMULATION	NFA Closed
536	E	M-016	SATELLITE ACCUMULATION	RFI 2016
539	E	M-115	SATELLITE ACCUMULATION AREA	NFA Closed
550	E	M-184	SATELLITE ACCUMULATION AREA (3)	NFA Closed
572	E	M-212	SATELLITE ACCUMULATION AREA	NFA Closed
577	E	T-017	SATELLITE ACCUMULATION AREA	NFA Closed
578	E	T-091	SATELLITE ACCUMULATION AREA	NFA Closed
589	E	E-516	SATELLITE ACCUMULATION AREA	NFA Closed
590	E	E-517	SATELLITE ACCUMULATION AREA	NFA Closed
591	E	E-529	SATELLITE ACCUMULATION AREA	NFA Closed
592	E	M-006	SATELLITE ACCUMULATION AREA	NFA Closed
593	E	M-019A	SATELLITE ACCUMULATION AREA	NFA Closed
594	E	M-027	SATELLITE ACCUMULATION AREA	RFI 2016
595	E	M-043	SATELLITE ACCUMULATION AREA	RFI 2016
596	E	M-055	SATELLITE ACCUMULATION AREA	NFA Closed
597	E	M-057A	SATELLITE ACCUMULATION AREA	NFA Closed
598	E	M-071	SATELLITE ACCUMULATION AREA	NFA Closed
599	E	M-102	SATELLITE ACCUMULATION AREA	NFA Closed
600	E	M-111	SATELLITE ACCUMULATION AREA	NFA Closed
601	E	M-174	SATELLITE ACCUMULATION AREA	NFA Closed
602	E	M-208	SATELLITE ACCUMULATION AREA	NFA Closed
603	E	T-029B	SATELLITE ACCUMULATION AREA	NFA Closed
604	E	M-241	SATELLITE ACCUMULATION AREA	NFA Closed

<b>SWMU</b>	<b>Group</b>	<b>Building</b>	<b>SWMU Description</b>	<b>Status</b>
605	E	T-096	SATELLITE ACCUMULATION AREA	NFA Closed
111	F	M-009B	SUMP	
112	F	M-013	SOUTH SUMP	
113	F	M-013	WEST SUMP	
114	F	M-013	OLD EAST SUMP LOCATION	RFI 2000 Report
115	F	M-016	OLD SUMP LOCATION	RFI 2000 Report
116	F	M-020	SUMP	
117	F	M-022	SUMP	
118	F	M-023	OLD SUMP LOCATION	RFI 2000 Report
119	F	M-024	SUMP	
120	F	M-027	SUMP	
121	F	M-042	SUMP	RFI 2000 Report
122	F	M-043	NON-HAZARDOUS WASTE SUMP	
123	F	M-056	SUMP	
124	F	M-057	SPILL CONTAINMENT SUMP	RFI 2000 Report
128	F	M-115	RECIRCULATION SUMP	
129	F	M-120	SUMP	
130	F	M-174	SOUTH SUMP	
131	F	M-605	NORTH SUMP	
132	F	M-605	SOUTH SUMP	
133	F	M-605	WEST SUMP	
134	F	M-605	EAST SUMP	
135	F	M-504	NORTH SUMP	
136	F	M-504	SOUTH 2 SUMPS	
137	F	M-519	SUMP	
138	F	M-522	INACTIVE SUMP	RFI 2000 Report
139	F	M-085	DEACTIVATED SUMP	RFI 2000 Report
140	F	M-590	NORTH SUMP	
141	F	M-590	SOUTH SUMP	
142	F	M-520	INACTIVE SUMP	RFI 2000 Report
143	F	M-521	SUMP	
144	F	M-523	SUMP	
145	F	M-201	SUMP	
146	F	M-208	EMERGENCY CONTAINMENT SUMP	RFI 2000 Report
147	F	M-209	SUMP	

SWMU	Group	Building	SWMU Description	Status
148	F	M-210	SUMP	
149	F	M-212	OLD NORTH SUMP LOCATION	RFI 2000 Report
150	F	M-212	OLD SOUTH SUMP LOCATION	RFI 2000 Report
151	F	M-214	SUMP	
152	F	M-218	SUMP	
153	F	M-528	SUMP	
154	F	M-588	EMERGENCY CONTAINMENT SUMP	RFI 2000 Report
155	F	M-034	SUMP	
156	F	M-693	SUMP	
157	F	M-694	SUMP	
160	F	M-125	NORTH SUMP	
161	F	M-125	SOUTH SUMP	
162	F	M-126	OLD NORTH SUMP LOCATION	RFI 2000 Report
163	F	M-126	OLD MIDDLE SUMP LOCATION	RFI 2000 Report
164	F	M-126	SOUTH SUMP	
165	F	M-087	EMERGENCY CONTAINMENT SUMP	RFI 2000 Report
166	F	M-526	SUMP	
167	F	M-571	NORTH SUMP	
168	F	M-571	SOUTH SUMP	
169	F	M-572	SUMP	
170	F	M-573	WEST SUMP	
171	F	M-081	SUMP	
172	F	M-606	NORTH SUMP	
173	F	M-606	SOUTH SUMP	
174	F	M-145	SUMP	
175	F	M-055	GARAGE BAY PIT AND SUMP	
176	F	M-309	SUMP	
177	F	E-502	OLD SUMP LOCATION	RFI 2000 Report
178	F	M-570	SUMP	
179	F	M-524	SUMP	
180	F	M-207	SUMP	
181	F	M-025	SUMP	
182	F	T-091	NON-HAZARDOUS WASTE SUMP	
183	F	M-508	SUMP	
184	F	M-590	EAST SUMP	

<b>SWMU</b>	<b>Group</b>	<b>Building</b>	<b>SWMU Description</b>	<b>Status</b>
186	F	M-687	OLD SUMP LOCATION	RFI 2000 Report
187	F	E-512	SUMP	
188	F	M-629	SUMP	
189	F	E-517	NON-HAZARDOUS WASTE SUMP	
190	F	M-174	WEST SUMP	RFI 2000 Report
196	F	M-034	OLD PERCHLORIC ACID SUMP LOCATION	
310	F	M-323	SUMP	
311	F	M-157	OLD SUMP LOCATION	
312	F	M-305	OLD GARAGE SUMP LOCATION	RFI 2000 Report
313	F	S-608	SUMP	
314	F	M-571	SOUTH SUMP	
316	F	M-622	2 INACTIVE SUMPS	
317	F	M-638	SUMP	RFI 2000 Report
323	F	M-115	INACTIVE SUMP	
324	F	M-115	SUMP	
327	F	M-115	TACTICAL WASHOUT SUMP	
328	F	M-115	TACTICAL WASHOUT SUMP	RFI 2000 Report
333	F	M-573	EAST SUMP	
346	F	M-087	SOUTH SUMP (EMERGENCY CONTAINMENT)	
351	F	T-112	SUMP	
454	F	M-043	EAST SUMP	RFI 2000 Report
456	F	M-056	PRODUCT SOLVENT CONTAINMENT SUMP	
457	F	M-083	OLD SUMP LOCATION	
465	F	M-002-1	LAUNDRY SUMP AND DRAINFIELD	
473	F	M-052	DEGREASER SUMP	RFI 2000 Report
487	F	M-320	WEST SUMP	
488	F	M-320	EAST SUMP	
489	F	M-320	NORTH SUMP	
497	F	T-053	SUMP	RFI 2000 Report
535	F	M-013	OLD SUMP LOCATION	
540	F	T-021	OLD SUMP LOCATION	
541	F	M-179	DEGREASER SUMP	
552	F	M-174	EAST SUMP	RFI 2000 Report
573	F	M-701	SUMP	
574	F	M-702	EAST SUMP	

SWMU	Group	Building	SWMU Description	Status
575	F	M-702	WEST SUMP	
193	G	M-174	OLD HYDROGEN FLUORIDE PIT	
194	G	M-147	OLD MINUTEMAN CANISTERS AND DEBRIS	RFI 2000 Report
200	G	T-035	BERYLLIUM CONTAMINATED WASTES DISPOSAL AREA	RFI 2000 Report
204	G	M-227	CS DISPOSAL SITE	
208	G	M-136	OLD WASTE OIL PIT	RFI 2000 Report
209	G	M-136	LANDFILL	
212	G	M-186	OLD INDUSTRIAL WASTE LANDFILL	RFI 2000 Report
213	G	M-136	ASBESTOS WASTE TRENCH	
214	G	M-136	INDUSTRIAL WASTE TRENCH	
215	G	M-136	INDUSTRIAL WASTE TRENCH	
216	G	M-136	INDUSTRIAL WASTE TRENCH	
217	G	M-136	INDUSTRIAL WASTE TRENCHES A, B, & C	
218	G	M-136	INDUSTRIAL WASTE TRENCH	
219	G	M-136	INDUSTRIAL WASTE TRENCH	
220	G	M-136	INDUSTRIAL WASTE TRENCH	
221	G	M-136	WASTE TRENCH	
222	G	M-136	WASTE DISPOSAL PIT	
223	G	M-136	WASTE TRENCHES	
224	G	M-336	SANITARY LANDFILL	RFI 2000 Report
296	G	M-046	POINT OF THE MOUNTAIN LANDFILL SITE	RFI 2000 Report
334	G	M-136	INDUSTRIAL WASTE TRENCH	
335	G	M-136	INDUSTRIAL WASTE TRENCHES A, B, & C	
462	G	M-225	LANDFILL SITE TO THE EAST	
481	G	M-174	BUILDING DEBRIS DISPOSAL	
534	G	X-9	SHREDDED PAPER DISPOSAL AREA	
547	G	M-311	EXCESS ROAD OIL DISPOSAL AREA	RFI 2000 Report
549	G	I-019	OLD TEST AREA LANDFILL	
554	G	M-136	OLD INDUSTRIAL WASTE TRENCHES	
555	G	M-186	OLD INDUSTRIAL LANDFILL TO THE EAST	RFI 2000 Report
637	G	PLT-3	HOLMGREN LANDFILL	Voluntray Cleanup
654	G	S OF M-636	Construction Debris Disposal	
236	H	M-034	PERCHLORIC ACID SPILL SITE	
237	H	M-080	PCB SPILL SITE	
238	H	M-052	METHYLCHLOROFORM SPILL SITE	

SWMU	Group	Building	SWMU Description	Status
469	H	M-014	FUEL OIL SPILL	Voluntray Cleanup NOV Cleanup Investigated Investigated Assessment Assessment Assessment Assessment
530	H	M-705	TANK RUPTURE AREA	
647	H	M-136	PYRIDINE CONTAMINATED SOILS	
675	H	M-576	BOILER SPILL CONTAINING PERCHLORATE	
677	H	M-721	RELEASE	
680	H	M-115	PERCHLORATE WASHOUT LINE LEAK UNDER BLDG. M-115	
681	H	M-705	Perchlorate trench release under building	
682	H	M-115	Perchlorate release from building to south hillside	
683	H	M-590	M-590 NaOH release under building Nov 2015, no clean-up standard	
239	I	M-636	PHOTOGRAPHIC WASTE TANK	
240	I	M-039	SPENT FIXER TANK	
241	I	M-114	FIXER AND DEVELOPER TANKS	
242	I	M-508	PHOTOGRAPHIC WASTE RECOVERY TANKS	
307	I	M-009	FIXER TANK AND CONTAINMENT SUMP	
308	I	A-001	PHOTOGRAPHIC WASTE TANK	
347	I	A-002	PHOTOGRAPHIC WASTE TANK (UPPER)	
348	I	M-197	FIXER AND DEVELOPER TANKS	
450	I	A-002	FIXER ACCUMULATION TANKS	
461	I	M-224	STAINLESS STEEL TANK	
496	I	T-024	INACTIVE PROPELLANT WASHOUT TANKS	
500	I	E-516	MOBILE WASTE OIL TANK	RFI 2000 Report
510	I	M-186	PHOTOGRAPHIC FIXER TANK AND WASTE OIL TANKS	
511	I	M-191	MOBILE CONTAINER	
513	I	M-193	MOBILE CONTAINER	
515	I	M-392	VESSELS (4)	
522	I	M-512	VACUUM COLLECTION DRUMS	
656	I	M-305	Transporter Maintenance Floor Wash Collection	
291	J	M-136	DRUM STORAGE	
551	J	M-187	OLD DRUM STORAGE AREA	
230	K	E-516	NORTH DRAINAGE DITCH	NFA Closed
235	K	E-516	BUILDING DISCHARGE TO E-534; HISTORICALLY TO NDD	NFA Closed
250	K	M-085	SURFACE DISCHARGE (NOT FOUND DURING RFA)	
251	K	M-086	AUTOCLAVE COOLING DISCHARGE	
252	K	M-087	SURFACE DISCHARGE (NOT FOUND DURING RFA)	



<b>SWMU</b>	<b>Group</b>	<b>Building</b>	<b>SWMU Description</b>	<b>Status</b>
253	K	M-111	BUILDING DISCHARGE	
255	K	M-179N	SURFACE BUILDING DISCHARGE	NFA Closed
256	K	M-179SE	COOLING WATER DISCHARGE	NFA Closed
257	K	M-014N	SURFACE BUILDING DISCHARGE	NFA Closed
258	K	M-033B	SURFACE BUILDING DISCHARGE	NFA Closed
259	K	M-053E	SURFACE BUILDING DISCHARGE	RFI 2000 Report
260	K	M-053-BP	SURFACE BUILDING DISCHARGE	NFA Closed
261	K	M-067	SURFACE BUILDING DISCHARGE	NFA Closed
263	K	M-072	SURFACE BUILDING DISCHARGE	NFA Closed
264	K	M-641	BUILDING DISCHARGE	NFA Closed
265	K	M-642	BUILDING DISCHARGE	
266	K	S-501	BOILER DISCHARGE	NFA Closed
267	K	A-009	BOILER DISCHARGE	NFA Closed
268	K	M-008	SURFACE BUILDING DISCHARGE	NFA Closed
269	K	M-010	SURFACE BUILDING DISCHARGE	NFA Closed
270	K	M-014S	SURFACE BUILDING DISCHARGE	NFA Closed
271	K	M-576-N	BUILDING DISCHARGE	RFI 2000 Report
272	K	M-576-S	COOLING WATER DISCHARGE	
273	K	M-585	BUILDING DISCHARGE	RFI 2000 Report
273	K	M-585-N	LABORATORY BUILDING SURFACE DISCHARGE	RFI 2000 Report
274	K	M-593	BUILDING DISCHARGE	NFA Closed
275	K	M-600	BUILDING DISCHARGE	
276	K	M-601	BUILDING DISCHARGE	
277	K	M-629	SURFACE DISCHARGE (NO FLOW FOUND IN RFA)	
278	K	M-639	BUILDING DISCHARGE	
279	K	E-502	FORMER BOILER DISCHARGE; HISTORICALLY TO NDD	NFA Closed
280	K	E-512	BUILDING DISCHARGE TO BLUE CREEK; HISTORICALLY TO NDD	IRP Report
281	K	E-516	BUILDING DISCHARGE TO E-534; HISTORICALLY TO NDD	NFA Closed
282	K	E-517-W	BUILDING DISCHARGE TO THE NORTH DRAINAGE DITCH	NFA Closed
283	K	E-529	BUILDING DISCHARGE TO BLUE CREEK; HISTORICALLY TO NDD	NFA Closed
284	K	M-508	BUILDING DISCHARGE TO BLUE CREEK; HISTORICALLY TO NDD	NFA Closed
285	K	M-570	BUILDING DISCHARGE	RFI 2000 Report
286	K	M-205	SURFACE BUILDING DISCHARGE	RFI 2000 Report

SWMU	Group	Building	SWMU Description	Status
287	K	T-006A	SURFACE BUILDING DISCHARGE	RFI 2000 Report
289	K	T-021A	BUILDING DISCHARGE	
326	K	E-515	ACID DRAIN	NFA Closed
357	K	E-519	BUILDING DISCHARGE TO BLUE CREEK; HISTORICALLY TO NDD	NFA Closed
358	K	M-113	BUILDING DISCHARGE	RFI 2000 Report
359	K	M-113	BUILDING DISCHARGE	
360	K	M-197BP	COOLING DISCHARGES	
363	K	M-594	BUILDING DISCHARGE	
364	K	M-598	BUILDING DISCHARGE	
365	K	M-602	BUILDING DISCHARGE	
366	K	M-636SE	BOILER AND COOLING DISCHARGE	
370	K	M-694	BOILER DISCHARGE	
371	K	M-689	COOLING DISCHARGE	
373	K	M-508	BUILDING DISCHARGE TO BLUE CREEK; HISTORICALLY TO NDD	
374	K	M-585	BUILDING DISCHARGE	RFI 2000 Report
375	K	M-621	BUILDING DISCHARGE	
376	K	M-622	BUILDING DISCHARGE	
377	K	M-623	BUILDING DISCHARGE	
381	K	M-640	BOILER AND COOLING DISCHARGE	
384	K	M-591	BUILDING DISCHARGE	
385	K	M-595	BUILDING DISCHARGE	
386	K	M-599	BUILDING DISCHARGE	
387	K	M-603	BUILDING DISCHARGE	
388	K	M-596	BUILDING DISCHARGE	
390	K	M-604	BUILDING DISCHARGE	RFI 2000 Report
392	K	M-597	BUILDING DISCHARGE	
394	K	M-605	BOILER CONDENSATE DISCHARGE IN EMERGENCIES	
398	K	T-017A	BUILDING DISCHARGE	
399	K	T-018A	BUILDING DISCHARGE	
400	K	T-023	BUILDING DISCHARGE	
405	K	M-005	BOILER CONDENSATE (NO KNOWN DISCHARGE)	
406	K	M-006	BOILER CONDENSATE (NO KNOWN DISCHARGE)	
408	K	M-009	BUILDING DISCHARGE	

<b>SWMU</b>	<b>Group</b>	<b>Building</b>	<b>SWMU Description</b>	<b>Status</b>
409	K	M-010	SURFACE BUILDING DISCHARGE	NFA Closed
413	K	M-033C	SURFACE BUILDING DISCHARGE	NFA Closed
417	K	E-512	BUILDING DISCHARGE TO BLUE CREEK; HISTORICALLY TO NDD	NFA Closed
419	K	E-516	BUILDING DISCHARGE TO E-534; HISTORICALLY TO NDD	NFA Closed
424	K	M-011	BUILDING DISCHARGE	
425	K	M-039	ACTIVE X-RAY BLDG DISCHARGE TO INJ WELL THEN SURFACE	Closed with monitoring
426	K	M-114	X-RAY BUILDING DISCHARGE	Closed with monitoring
429	K	M-111	BUILDING DISCHARGE	
431	K	M-179SE	COOLING WATER DISCHARGE	
432	K	M-066	SURFACE BUILDING DISCHARGE	RFI 2000 Report
433	K	M-067	SURFACE BUILDING DISCHARGE	NFA Closed
435	K	M-086	BUILDING DISCHARGE	
443	K	M-043	BOILER CONDENSATE (NOT FOUND DURING RFA)	
451	K	A-002	SURFACE WATER DISCHARGE	RFI 2000 Report
459	K	M-087	VACUUM PUMP DISCHARGE	
470	K	M-033	AIR COMPRESSOR DISCHARGE	
472	K	M-052	SURFACE BUILDING DISCHARGE	NFA Closed
483	K	M-197	X-RAY BUILDING DISCHARGE	RFI 2000 Report
491	K	T-004A	BUILDING DISCHARGE	
498	K	M-521	DISCHARGE TO BLUE CREEK	
503	K	E-519	ACID DRAIN	NFA Closed
516	K	M-504	LOW PRESSURE STEAM LINE DISCHARGE	
517	K	M-504	HYDRAULIC PUMP COOLING DISCHARGE	
520	K	M-512	BOILER DISCHARGE	
526	K	M-590	BOILER DISCHARGE	
527	K	M-606	BUILDING DISCHARGE	RFI 2000 Report
528	K	M-628	BOILER DISCHARGE	RFI 2000 Report
529	K	M-638	BOILER DISCHARGE	
532	K	M-705	BOILER DISCHARGE	
533	K	T-091	BOILER DISCHARGE	
557	K	T-051A	BUILDING DISCHARGE	
559	K	T-021D	SURFACE BUILDING DISCHARGE	RFI 2000 Report
606	K	M-627	SURFACE DISCHARGE	

<b>SWMU</b>	<b>Group</b>	<b>Building</b>	<b>SWMU Description</b>	<b>Status</b>
610	K	M-627	BOILER CONDENSATE DISCHARGE	NFA Closed
611	K	M-009	SURFACE BUILDING DISCHARGE	
612	K	M-010	BOILER DISCHARGE	
613	K	M-052W	DEGREASER SUMP DISCHARGE	
614	K	M-056	BOILER CONDENSATE DISCHARGE	RFI 2000 Report
615	K	M-057	SURFACE BUILDING DISCHARGE	
617	K	E-522	FIRE STATION VEHICLE WASH DISCHARGE	
618	K	M-514	BAC COOLING DISCHARGE	
619	K	M-627	BUILDING DISCHARGE	RFI 2000 Report
620	K	M-702	BUILDING DISCHARGE	
621	K	M-055W	SURFACE BUILDING DISCHARGE	
622	K	M-364	BUILDING DISCHARGE	
623	K	M-055E	SURFACE DISCHARGE	NFA Closed
642	K	M-040	SURFACE BUILDING DISCHARGE	
644	K	I-005	SURFACE DISCHARGE	
649	K	M-585	STRAND BURNER EXHAUST DISCHARGE TO GROUND	
650	K	M-019A	SURFACE BUILDING DISCHARGE	RFI 2000 Report
651	K	M-009-NE	STRAND BURNER EXHAUST DISCHARGE TO GROUND	RFI 2000 Report
652	K	M-009	MORTON IGNITOR BURN TRAY AREA	RFI 2000 Report
657	K	M-52	STORM DRAIN DISCHARGE AREA	IRP Report
659	K	E-512	E-512 DRAINAGE DITCH	
660	K		FAUST VALLEY DRAINAGE COURSE	
661	K		BLUE CREEK	
673	K	M-120	SURFACE DISCHARGE	RFI 2000 Report
674	K	T-112	INTERIOR FLOOR DRAIN LEAK	Investigated
227	L	M-585	OLD FRENCH DRAIN SYSTEM	IRP Report
228	L	M-053-MH	LAB SINK DISCHARGE	RFI 2000 Report
234	L	I-010-S	SOUTH SINK DRYWELL	RFI 2000 Report
254	L	M-117	SUBSURFACE BUILDING DISCHARGE	RFI 2000 Report
353	L	T-053A	SUBSURFACE BUILDING DISCHARGE	RFI 2000 Report
354	L	T-097A	SUBSURFACE BUILDING DISCHARGE	RFI 2000 Report
355	L	T-111	SUBSURFACE BUILDING DISCHARGE	
395	L	M-348	SUBSURFACE BOILER DISCHARGE	

<b>SWMU</b>	<b>Group</b>	<b>Building</b>	<b>SWMU Description</b>	<b>Status</b>
397	L	T-015A	SUBSURFACE BUILDING DISCHARGE	RFI 2000 Report
401	L	T-024A	SUBSURFACE BUILDING DISCHARGE	RFI 2000 Report
402	L	T-051A	SUBSURFACE BUILDING DISCHARGE	RFI 2000 Report
436	L	I-010-SE	SOUTHEAST SINK DRYWELL	RFI 2000 Report
444	L	M-019A	DRYWELL	NFA Closed
446	L	T-003	SUBSURFACE BUILDING DISCHARGE	RFI 2000 Report
493	L	T-014A	SUBSURFACE BUILDING DISCHARGE	RFI 2000 Report
558	L	T-051A	OLD DRYWELL LOCATION	
608	L	M-338	FRENCH DRAIN FOR BOILER DISCHARGE	RFI 2000 Report
609	L	M-009NE	ABANDONED DRYWELL (POSSIBLY REMOVED)	RFI 2000 Report
624	L	T-051A-S	BUILDING DISCHARGE TO A DRYWELL	
625	L	M-153	SEPTIC DRAINFIELDS A, B, AND C	RFI 2000 Report
626	L	M-002-2	ABANDONED SEPTIC DRAINFIELD SYSTEM	RFI 2000 Report
627	L	M-002-3	SEPTIC DRAINFIELD SYSTEM	RFI 2000 Report
628	L	M-019A	SEPTIC DRAINFIELD SYSTEM	RFI 2000 Report
629	L	M-057	SEPTIC DRAINFIELD	
630	L	M-072	SEPTIC DRAINFIELD	RFI 2000 Report
631	L	M-191-S	SEPTIC DRAINFIELD	RFI 2000 Report
632	L	M-193-N	SEPTIC DRAINFIELD	RFI 2000 Report
633	L	M-043	SEPTIC DRAINFIELD	
636	L	T-051A-2	DRYWELL	
638	L	M-193-S	SEPTIC DRAINFIELD	RFI 2000 Report
639	L	M-585	SEPTIC SYSTEM	
640	L	M-009SW	SOUTH WEST ABANDONED DRYWELL	RFI 2000 Report
643	L	M-009SE	SOUTH EAST ABANDONED DRYWELL	RFI 2000 Report
645	L	I-010NE	DRYWELL	RFI 2000 Report
646	L	M-071	SEPTIC SYSTEM	RFI 2000 Report
662	L	M-015A	DRYWELL	RFI 2000 Report
663	L	M-015A	SEPTIC DRAINFIELD	RFI 2000 Report
664	L	I-10	SEPTIC DRAINFIELD	RFI 2000 Report
665	L	M-53	SUBSURFACE DISCHARGE	RFI 2000 Report
666	L	M-056	DRYWELL	RFI 2000 Report
667	L	I-5	SEPTIC DRAINFIELD	RFI 2000 Report

<b>SWMU</b>	<b>Group</b>	<b>Building</b>	<b>SWMU Description</b>	<b>Status</b>
671	L	M-58	DRYWELL	RFI 2000 Report
676	L	M-397	FLOOR DRAIN CONNECTED TO DRAIN PIPE	RFI 2000 Report
678	L	M-201	SEPTIC DRAIN SYSTEM	
679	L	M-205	SEPTIC DRAIN SYSTEM	
192	M	M-227	INACTIVE NEUTRALIZATION AND CONTAINMENT PONDS	NFA Closed
210	M	M-186	OIL SEPARATION POND (NORTH POND)	NFA Closed
211	M	M-186	NEUTRALIZATION POND (SOUTH POND)	NFA Closed
231	M	M-115	OLD INDUSTRIAL WASTEWATER POND	Investigated
232	M	M-115	OLD INDUSTRIAL WASTEWATER POND	Investigated
320	M	M-345	OLD NORTH DRAINAGE DITCH DRAIN PONDS (3)	NFA Closed
321	M	M-345	OLD NORTH DRAINAGE DITCH DRAIN PONDS (3)	NFA Closed
322	M	M-345	OLD NORTH DRAINAGE DITCH DRAIN PONDS (3)	NFA Closed
345	M	M-014	BOILER DISCHARGE COLLECTION POND	NFA Closed
658	M	E-534	SANITARY SEWAGE TREATMENT EVAPORATION POND	RFI 2000 Report
669	M	M-13	DRYING PONDS (2)	RFI 2000 Report
670	M	M-16	DRYING PONDS (2)	RFI 2000 Report
452	N	M-008	DUST AND GRIT BLAST COLLECTORS	RFI 2016
453	N	M-043	GRIT BLAST COLLECTORS	RFI 2016
455	N	M-053	DUST COLLECTORS	RFI 2016
458	N	M-086	DUST COLLECTOR	RFI 2016
460	N	M-210	DUST COLLECTOR	RFI 2016
466	N	M-005	DUST COLLECTORS	RFI 2016
468	N	M-006	DUST COLLECTORS	RFI 2016
471	N	M-052	GRIT BLAST COLLECTORS	RFI 2016
474	N	M-066	GRIT BLASTING AREA	
476	N	M-113	GRIT BLAST COLLECTION	RFI 2016
477	N	M-113	DUST COLLECTORS	RFI 2016
480	N	M-174	DUST COLLECTOR	RFI 2016
499	N	E-512	DUST AND GRIT BLAST COLLECTORS	RFI 2016
501	N	E-517	NORTH DUST COLLECTORS	RFI 2016
502	N	E-517	DUST COLLECTORS	RFI 2016
508	N	M-179	DUST COLLECTORS	RFI 2016
509	N	M-179	GRIT BLAST COLLECTOR	RFI 2016

<b>SWMU</b>	<b>Group</b>	<b>Building</b>	<b>SWMU Description</b>	<b>Status</b>
518	N	M-508	SOUTH DUST COLLECTORS	RFI 2016
519	N	M-508	DUST COLLECTORS ON EAST SIDE	RFI 2016
525	N	M-585	DUST COLLECTORS	
537	N	M-079	DUST COLLECTORS	RFI 2016
538	N	M-103	DUST AND GRIT BLAST COLLECTOR	RFI 2016
542	N	M-508	GRIT BLAST COLLECTION	
545	N	M-013	AP DUST COLLECTION	
297	O	M-043	8 OLD UNDERGROUND STORAGE PIPES	RFI 2000 Report
607	O	M-055	REMOVED UNDERGROUND WASTE OIL STORAGE TANK	
616	O	M-137A	REMOVED UNDERGROUND STORAGE TANK	RFI 2000 Report
225	P	M-046	MINE TAILINGS	NFA Closed
226	P	M-046	MINE TAILINGS	NFA Closed
197	Q	M-139	OLD HYDRAZINIUM DIPERCHLORATE STORAGE	
198	Q	M-132	OLD HYDRAZINIUM DIPERCHLORATE STORAGE	
199	Q	M-057	OLD HYDRAZINIUM DIPERCHLORATE STORAGE	RFI 2000 Report
205	Q	M-224	OLD HYDRAZINIUM DIPERCHLORATE STORAGE	
206	Q	M-223	OLD BERYLLIUM PROPELLANT STORAGE	
463	R	M-052	PAINT BOOTH OVERSPRAY COLLECTION	
464	S	E-517	WET SCRUBBER	
494	T	T-018	FLUORESCCEIN DYE TEST AREA	
479	U	M-187	NORTH DISPERSION AREA TO THE WEST	RFI 2000 Report
634	U	M-148	SOUTH DISPERSION AREA	RFI 2000 Report
655	V	M-40	Magnesium Grinding Area	RFI 2000 Report
672	W	E-534	ACTIVATED SLUDGE TREATMENT PLANT	RFI 2000 Report