

**FACT SHEET AND STATEMENT OF BASIS  
ENSIGN-BICKFORD COMPANY  
UPDES PERMIT # UT0025283  
RENEWAL PERMIT FOR MINOR INDUSTRIAL FACILITY**

**FACILITY CONTACT:** Mr. Haldon R. Jaussi  
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**DESCRIPTION OF FACILITY:** An explosives manufacturing plant has been operated at the present Ensign-Bickford Company (EBCo) site since prior to World War II. Around June of 1986 a large quantity of dilute nitric acid was released at this facility as the result of liner failure in a storage pond. Prior to 1988 the wastewater disposal practices at the EBCo site may have included disposal of industrial waste from explosives production into unlined ditches, pits, and ponds. Elevated concentrations of nitrates and low concentrations of constituents of energetic materials (CEM's) have been detected in a municipal water supply well owned and operated by Mapleton City. This prompted Mapleton City to remove this well from service in November of 1994. EBCo, in cooperation with Mapleton City and the Utah Department of Environmental Quality (DEQ) has developed a plan to reactivate the well for use in either the municipal water system or in a municipal pressurized irrigation system. The following compounds have been detected in the Mapleton No. 1 well:

Nitrate	
RDX	Cyclotrimethylenetrinitramine
EGDN	Ethylene Glycol Dinitrate; Nitroglycol; Glycol Dinitrate
DEGDN	Diethylene Glycol Dinitrate; Dinitrodiglycol

In addition to the compounds identified above, the following compounds have been detected in ground water between the EBCo site and the Mapleton No. 1 well:

HMX	Cyclotetramethylenetetranitramine
PETN	Pentaerythritol Tetranitrate
TEGDN	Triethylene Glycol Dinitrate
TMETN	Metriol Trinitrate; 1,3-Propanediol; 2-Methylnitrate
BTTN	Butanetriol Trinitrate
TNT	Trinitrotoluene

DEQ has required that the Mapleton No. 1 well be pumped to serve as a hydraulic barrier to impede further northward migration of nitrate and other CEM's. To comply with this condition, the Mapleton No. 1 well reactivation alternative has been designed to include surface water discharge that enables pumping of the well when municipal demand requirements do not warrant the well's use. The reactivation plan includes the utilization of a granular activated carbon (GAC) treatment system that will remove CEM's from the ground water prior to use in the culinary and/or pressurized irrigation systems. No reduction of nitrate concentration is

contemplated for water discharged to surface water, nor will any be required to meet the permit effluent limitations contained in this permit.

The Hobble Creek portion of the Facility consists of flow from the Mapleton GAC facility and the Orton GAC facility with a discharge to either the Mapleton pressurized Irrigation System or directly to Hobble Creek. The flow from the Mapleton GAC makes up roughly 2/3 of the flow and the Orton GAC makes up roughly 1/3 of the flow to the system.

The Spanish Fork treatment facility is located at 3710 East Hwy. 6 in Spanish Fork. This discharge is mostly, if not completely, discharged to the City of Spanish Fork's pressurized irrigation system and only makes the Spanish Fork River when irrigation activities do not warrant its' use (approximately November through March). Effluent is piped via a conveyance pipeline (approximately 4.5 miles of 12-inch diameter PVC) from the treatment facility to a vault (located approximately 500 feet from the river), where it blends with other waters not associated with this groundwater recovery process before reaching the river.

**SUMMARY OF CHANGES FROM PREVIOUS PERMIT**

The permit is being modified to add a new discharge location to the current permit. The facility has requested a new discharge location to assist Spanish Fork City when supplying water to the pressurized irrigation system. The current discharge location requires the facility to open and close over 50 valves twice a year to convey water to the current discharge location. Moving the discharge location will reduce that number to two valves. The existing outfall to the Spanish Fork River will be renamed to Outfall 002a and the new outfall will be named Outfall 002b. The limits for Outfall 002a will not change from the current permit. The compliance point for both of these locations will be the Spanish Fork GAC building.

There was not reliable flow data for the section of the Spanish Fork River where the new outfall will be located. Therefore, a 7/Q10 minimum flow was assumed to be zero. Assuming no dilution and no mixing zone is conservative approach. Based on the facilities discharge data for the past 5 year, they should easily meet the limits for a zero discharge scenario. The facility will only discharge to this reach during the non-irrigation season.

**DISCHARGE**

**DESCRIPTION OF DISCHARGE**

The new outfall locations are listed below. Outfall 001 will remain unchanged in this modification.

<u>Outfall Number</u>	<u>Location of Discharge Outfall</u>
002a	Discharge to the Spanish Fork River. This discharge is located at a latitude of 40° 05' 52" and a longitude 111° 39' 48" of Compliance samples to be taken in the GAC building before discharge to the Spanish Fork River or Spanish Fork pressurized irrigation system.
002b	Discharge to the Spanish Fork River. This discharge is located at a latitude of 40° 05' 11" and a longitude 111° 35' 48" of Compliance samples to be taken in the GAC building before discharge to the Spanish Fork River or Spanish Fork pressurized irrigation system.

**BASIS FOR EFFLUENT LIMITATIONS:** Utah Administrative Code (UAC) R317-1-3 lists State secondary treatment standards for five-day biochemical oxygen demand (BOD<sub>5</sub>), total suspended solids (TSS), fecal coliforms, total coliforms, and pH. Based on data provided in the original permit application, and because the effluent is composed only of ground water, BOD<sub>5</sub>, TSS, and E. coli limitations are not necessary, thus will not be included in this permit. However, pH is applicable to this discharge permit and will be limited to between 6.5 and 9.0 at Outfalls 002a and 002b.

Additional concerns addressed in this permit are the concentration and types of organic constituents in the effluent. As discussed above, a number of organic compounds are found to be present in the effluent. Most of these organic compounds are at very low concentrations, and the major confirmed component of all the organics is RDX. Therefore, if RDX concentrations are sufficiently controlled then other organic parameters should likewise remain below concentrations of concern. There is no State numeric water quality standard for RDX. However, there is a published EPA Lifetime Drinking Water Health Advisory (Office of Drinking Water, U.S. EPA, Washington D.C., November 1988) for RDX of 0.002 mg/L. The methodology for deriving the 0.002 mg/L health advisory for RDX has been challenged by EBCo, and will continue to be the subject of further evaluation by EBCo and the Department of Environmental Quality. Until an alternate resolution is determined, the lifetime health advisory will serve as the basis for establishing the effluent limits (e.g., the concentration of RDX, after mixing in the receiving stream, shall not exceed 0.002 mg/L).

Nitrate nitrogen is also a parameter of concern. It is included in the State drinking water standards at a concentration of 10 mg/l and is included in the State water quality standards as a pollution indicator (4 mg/L in order to protect against eutrophication). If it appears that the in-stream mix below the Strawberry Tunnel Irrigation return flow may exceed 4 mg/L, either that limit must be met, or an appropriate stream assessment must be completed to determine what in-stream mix is appropriate.

The wasteload allocation indicates that there are six flow ranges needed to determine specific RDX and nitrate nitrogen effluent limit concentrations at Outfall 001 and Outfall 002. These flow ranges, and the corresponding effluent limit concentrations for RDX and nitrate nitrogen are shown in the tables below. EBCo will be required to meet the RDX and nitrate nitrogen concentrations of the flow range associated with the highest flow rate of the month. For example, if EBCo's discharges varied in any particular month, but reached no higher than 2.0 cfs at any time, then the flow range would be considered in the 1.68-2.23 cfs range in the table, and the corresponding effluent limitation would be 0.007 mg/L for RDX, and 32.5 mg/L for nitrate nitrogen. EBCo's maximum effluent flow rate is limited to 6.13 cfs by this permit. When calculating these effluent limits, the maximum flow rate for each flow range was used as the effluent flow in the mass balance equation. Additionally, an additional 20% margin of safety factor was included when determining the final effluent limitation. The results of these calculations can be found in Table 2.

There is no published standard analytical method in the literature (which has been certified by EPA) as an approved method for detection of such low concentrations of RDX and other CEM compounds. Therefore, it was up to the State and the permittee to develop an appropriate analytical method for RDX and other CEM compounds. EPA Method SW8330 has been modified to facilitate low concentration quantification of RDX and other CEM compounds. Future advances in analytical technology may warrant appropriate modifications to this method.

The permit limitations for Outfall 002b are

<b>Table 2: Effluent Limitations Outfall 002a and Outfall 002b</b>				
Parameter, Units	30-Day Average	7-Day Average	Daily Minimum	Daily Maximum
pH, S.U.	NA	NA	6.5	9.0
Nitrate-Nitrogen, mg/L	NA	NA	NA	a/
RDX, ug/L b/	NA	NA	NA	a/
Total Phosphorus mg/L	Report	NA	NA	NA
Flow, cfs	NA	NA	NA	3.34
DO, mg/L c/	NA	NA	4.5	NA

a/ Nitrate nitrogen and RDX limitations are based upon effluent flow ranges as indicated in the tables below. The permittee is required to meet the RDX and nitrate-nitrogen concentrations of the flow range associated with the highest flow rate of the month. The permittee is not allowed to discharge more than 3.34 cfs at any time.

b/ Analyses of RDX shall be made by the method appended to the fact sheet and statement of basis in Appendix A, or by any other method approved in writing by the Director.

c/ DO limits are only applicable if the discharge is going to surface waters.

<b>Table 5: RDX And Nitrate-Nitrogen Limits Based for Outfall 002b</b>		
Effluent Flow Range (cfs)	Daily Maximum RDX Concentration (mg/L)	Daily Maximum Nitrate-Nitrogen Concentration (mg/L)*
0 – 3.34	0.002	10

\*Assumes an upstream (background) nitrate-nitrogen concentration of 1 mg/L.

The RDX and Nitrate-Nitrogen Limits For Outfall 002a remain the same as the previous permit.

**PERMIT DURATION**

It is recommended that this permit be effective for the original duration of the permit, September 30, 2024.

Drafted by  
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Nick von Stackelberg  
Utah Division of Water Quality, (801) 536-4300

**PUBLIC NOTICE**

Began: August 5, 2020  
Ended: September 7, 2020

Comments will be received at:       195 North 1950 West  
  PO Box 144870  
  Salt Lake City, UT 84114-4870

The Public Noticed of the draft permit was published on the Utah Division of Water Quality's website. No comments were received during the public comment period.

During the public comment period provided under R317-8-6.5, any interested person may submit written comments on the draft permit and may request a public hearing, if no hearing has already been scheduled. A request for a public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing. All comments will be considered in making the final decision and shall be answered as provided in R317-8-6.12.

**ADDENDUM TO FSSOB**

During finalization of the Permit certain dates, spelling edits and minor language corrections were completed. Due to the nature of these changes they were not considered Major and the permit is not required to be re Public Noticed.

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# **ATTACHMENT 1**

## *Wasteload Analysis*

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