

1774

G-000-104.3

**PERMIT TO INSTALL (PTI) APPLICATION -
EXISTING STORM WATER RETENTION BASIN -
FEED MATERIAL PRODUCTION CENTER (FMPC)**

01/06/87

**DOE-15-88
DOE-ORO/OEPA
2
LETTER**



Department of Energy
Oak Ridge Operations
P. O. Box E
Oak Ridge, Tennessee 37831

1774

OCT 6 1987

DOE-15-88

Thomas A. Winston, District Chief
Southwest District Office
OEPA
7 East 4th Street
Dayton, Ohio 45402-2086

Dear Sir:

PERMIT TO INSTALL (PTI) APPLICATION - EXISTING STORM WATER RETENTION
BASIN - FEED MATERIALS PRODUCTION CENTER (FMPC)

Reference is made to Martyn Burt's September 18, 1987 letter to me
regarding the above subject (copy attached).

We concur in Mr. Burt's letter relative to the strategy that will be
employed in the processing of the PTI application for the coal pile
runoff collection, storm water/spill retention, biodegradation
demonstration facilities, and the storm water retention basin expansion.
We are in the process of addressing Ohio EPA's comments/questions
on the above applications that resulted from the August 18, 1987
meeting. When completed, these applications will be transmitted
to your office.

Mr. Burt's letter also provided several comments/questions regarding
the PTI application for the expanded storm water retention basin.
To the extent possible, these comments/questions were addressed
in the PTI application provided your office on October 1, 1987.
Let us know if Ohio EPA does not judge this to be acceptable.

We appreciate the extra PTI application forms and other information
provided by Mr. Burt.

Sincerely,


James A. Reafsnnyder
Site Manager

DP-84:Collier

Attachments:As Stated

cc w/att:

Martyn Burt, OEPA-Dayton
Kendra Dearth, OEPA-Dayton
Barbara Valentine, SE-31, ORO
Bob Kispert, WMCO

Dave Brettschneider, WMCO
Lou Bogar, WMCO
Linda Dolan, WMCO

1

1774

bcc w/o att:

Greg Fess - GC-21, FORS
John Cermack - Dpt. of Justice
Bill Hawkins - Frost & Jacobs
Bob Conner - WMCO

bcc w/att:

Bob Weidner - NLO

REPORT ON APPLICATION FOR PERMIT TO INSTALL
A NEW STORMWATER RETENTION BASIN AT US
DEPARTMENT OF ENERGY, FMPC OF FERNALD, OHIO

Introduction

U.S. Department of Energy, Feed Materials Production Center (FMPC) first submitted plans for installation of stormwater retention basins April 16, 1984 as part of a Permit to Install (PTI) application for a number of projects. The PTI application was assigned the number 05-1043. The Ohio EPA required that the application be divided into separate applications for stormwater retention, coal pile runoff and the full scale biodegradation system. The submission of a Permit to Install for stormwater retention is required by Order 6 of a Director's Findings and Orders (DF and O's) issued to FMPC June 26, 1987. The latest application for Permit to Install the stormwater retention basins was received at the Ohio EPA, Southwest District Office, October 1, 1987. This application retains the application number 05-1043. Accompanying the plans for the stormwater retention system is a contingency plan describing actions that will be taken to minimize potential environmental impacts to Paddy's Run and other portions of the environment, this is required by Order 7 of the DF and O's referenced above.

The goal of the completed storm water retention system is to retain and eventually divert to the Great Miami River via manhole 175 all storm water runoff from the production and

Page 2 - Report on Application for Permit to Install a New Stormwater Retention Basin at US Dept. of Energy, FMPC of Fernald, Ohio

supply areas resulting from a 10 year, 24 hour storm. This will prevent possibly contaminated suspended solids from entering Paddy's Run from an isolated 10 year, 24 hour storm event.

The Stormwater Retention System

Stormwater is collected by drains throughout the 136 acre plant process area plus 24 acres of drainage from parking lots and adjacent areas. The water during dry weather is routed via a storm sewer lift station (SSLS) to manhole 175 and the Great Miami River. The SSLS pumps are float activated. During storm events the SSLS pumps are manually shut off after the flow exceeds the capacity of the SSLS weir, the water then drains by gravity to the storm sewer retention basins.

The 10 year, 24 hour storm (4.1" rainfall) would result in an estimated 10.2 million gallons of storm runoff from the 160 acre drainage area. The calculations utilized a composite runoff coefficient of 0.56.

The existing stormwater retention basin is capable of storing 6.5 million gallons of stormwater run off. The capacity comprises the 0.577 million gallon emergency spill basin plus 5.71 million gallon settling chamber and 0.2 million gallon in the surcharged storm sewers. When the 300 gpm pump out rate is added in, this basin can handle approximately 7 million gallons before overflow occurs. The basin has a synthetic flexible

Page 3 - Report on Application for Permit to Install A New
Stormwater Retention Basin at US Dept. of Energy, [REDACTED]
FMPC of Fernald, Ohio

membrane liner installed over an 18" soil bentonite liner. There is an underdrain collection system installed between the two liners which routes any leakage from the basin via a sump back into the retention basin. In order to intercept the perched groundwater that exists in the area of the basin a collection system is installed beneath the soil bentonite layer. This groundwater is routed to the same sump as is the leakage collection system. A best available demonstrated technology performance standard of less than 40 gallons/acre/day leakage is being applied to the liner of the existing basin. To date leakage through the liner has remained well below that figure. Should leakage ever exceed the 40 gallon/acre year figure, corrective actions will be initiated. At present, the sump which intercepts leakage and groundwater for the existing basin is designed in such a fashion that it is extremely difficult to accurately determine the two separate flow rates. The contingency plan submitted with the PTI describes measures that will be taken to make separate measurement of groundwater and leakage possible. The PTI will contain a condition requiring that those measures be taken.

DOE propose to add a new stormwater retention basin of 4.0 million gallons capacity to the east of the existing basin. The liner and underdrain system will be installed in the same manner as that described for the west basin, enabling interception and

Page 4 - Report on Application for Permit to Install a New
Stormwater Retention Basin at US Dept. of Energy,
FMPC of Fernald, Ohio

separate measurement of both groundwater and leakage. The same BADT figure of 40 gallons/acre/day leakage through the synthetic liner will be used as the trigger point for corrective actions. The two storm water basins will be operated alternatively with one being filled while the other is allowed to sit quiescent prior to pump out. In the event of heavy storm events, when the first basin is filled, the gate to that basin will be shut and the second basin will then be filled. If both basins fill (after, approximately 9 hours) then the two basins will start to receive flow simultaneously over the top of the two sluice gates. At the same time, 150 gpm pump out from each basin will commence. If the capacity of the basins is exceeded overflow will occur over the emergency spillway to Paddy's Run. The total capacity of the storm sewer retention system, with a total of 300 gpm pump out starting after a 9 hour delay is 10.2 million gallons and 0.2 million gallons that is stored in the submerged storm sewers and an allowance of 0.4 million gallons for solids accumulation.

The basins will also accumulate solids. DOE has estimated a total yearly accumulation of 156,000 lbs of solids in the two basins. The proposed clean out schedule calls for solids removal once every 2 years once the new basin is constructed. This assumes clean out when the solids reach a depth of 6". DOE

Page 5 - Report on Application for Permit to Install a New
Stormwater Retention Basin at US Dept. of Energy,
FMPC of Fernald, Ohio

also propose to install an automatic suspended solids measuring device on the SWRB pump out line. Each pump out will continue until the TSS measurement in the effluent exceeds a predetermined level, (currently 45 ppm). When the draw down levels reach a point that equals a total capacity of 0.6 MGD, clean out will be scheduled to ensure the full 10.2 MGD capacity is available for storm water retention.

Clean out of accumulated solids will be accomplished one basin at a time, thus only one will be taken off line at any one time. DOE identify the method of solids removal that will most likely be used. The method involves the use of a mini dredge for withdrawing sediments in slurry form and a trailer mounted slurry treatment system for solids settling and dewatering. A demonstration solids removal exercise is planned. Any method used will be chosen so as to preserve the integrity of the basin liners. The solids removed from the SWRB may, or may not, be treated as a low level radioactive waste. A guideline for acceptable on site soil contamination has not yet been agreed upon between the FMPC, Ohio EPA, and U.S.E.P.A. When this guideline is set, it will be used to determine the method for SWRB solids disposal. If the uranium concentration level in the drums of sludge collected from the portable dewatering system is above the agreed upon FMPC Guideline for soils, the sludge will be treated as a low level radioactive waste and disposed of at an

Page 6 - Report on Application for Permit to Install a New
Stormwater Retention Basin at U.S. Dept. of Energy,
FMPC of Fernald, Ohio

approved low level waste burial site. If the uranium concentration level is less than this guideline for soils the sludge will be deposited on-site. The removed solids will be tested for EP toxicity if they are found to be acceptable by uranium standards for disposal on-site.

Monitoring equipment already in place in the storm water retention system include high and low pH alarms and an automatic suspended solids monitoring device in the storm sewer lift station. When the pH alarm is triggered the SSLS pumps are shut off, diverting the flow to the retention basins. DOE has identified additional monitoring equipment that will be installed, this is described below:

Additional monitoring equipment for the SWRB will most likely consist of two refrigerated samplers. One will be located at the 6-inch pump out discharge line of the basin and the other at the overflow spillway (NPDES permit 002). The sampler for the pump out discharge will draw a sample which is proportional to the outlet flow. The sampler at the outfall 002 will draw a sample when an overflow is occurring.

A vortex shedding flow meter is planned to be installed on the 6-inch pump out discharge line to provide flow measurement. In addition a flow indicator and recorder, temperature element and transmitter, temperature indicator and recorder, conductivity element and transmitter, conductivity indicator and recorder, pH element and transmitter, pH indicator/recorder, suspended solids

Page 7 - Report on Application for Permit to Install a New Stormwater Retention Basin at US Dept. of Energy, FMPC of Fernald, Ohio

transmitter, indicator, recorder, and instrument power supplies is planned to be located at the pump out monitoring point. The instruments shall be mounted in a local control panel. The alarm contacts from the instruments shall be transmitted to the Water Treatment Plant through a new telephone line service. The alarms will be monitored on a new annunciator located at the plant.

Construction of the new east SWRB will require the relocation of the drainage ditch that presently runs on a south westerly course to the east of the existing basin. Soils excavated during construction will be stockpiled on land immediately to the south of the existing basin which is outside the SWRB drainage area. Construction is planned to start April 1, 1988 on the new east basin.

Discussion

The proposed complete SWRB can retain all the run off from a 10 year, 24 hour storm event if both basins are empty at the beginning of the storm. Once filled, the basins will take approximately 24 days to empty when pumped out at 300 gallons per minute, provided no further rainfall occurs during that period. Furthermore it would take over 5 1/2 days to pump out enough volume so that the rainfall from a 1" rainfall could be retained. It is clear that sequential rainfall events each considerably less than the 10 year, 24 hour storm, will result in overflows to

Page 8 - Report on Application for Permit to Install a New
Stormwater Retention Basin at US Dept. of Energy,
FMPC of Fernald, Ohio

Paddy's Run. However, under those conditions flow in the creek would be high enough that environmental impact from the overflow would be much reduced and there would be little opportunity for solids/pollutants to contaminate the ground water. The proposed method of operation of the SWRB will provide for settling out the majority of solids washed in with the first flush of a major storm event.

The existing SWRB included an emergency spill basin (ESB) designed to accommodate any spill that may get to the storm sewer system. The effluent system for the entire basin is designed so that water can be drained from any one or any combination of ESB, east basin and west basin. DOE propose to discontinue use of the ESB as a spill containment system. Spills will be routed to one of the two basins, and can thus be isolated.

Stockpiling of excavated soils is proposed for an area south of the existing storm water retention basin SWRB which is outside the present drainage area of the proposed complete SWRB system. Precautions should be taken to ensure runoff from the stockpile does not carry solids (possibly contaminated) into the drainage ditch.

Page 9 - Report on Application for Permit to Install a New
Stormwater Retention Basin at US Dept. of Energy,
FMPC of Fernald, Ohio

Conclusion

The plans are satisfactory and should be approved with the
attached conditions.

Reviewed by:

Martyn G. Burt

Martyn G. Burt

Industrial WW Group Leader

Approved by:

James C. Simpson

James C. Simpson, P.E.

Supervisor, Div. Water Pollution
Control

Date: 11/12/87

lmr