



STATE OF MAINE

# DEPARTMENT OF ENVIRONMENTAL PROTECTION

ANGUS S. KING, JR.  
GOVERNOR

EDWARD O. SULLIVAN  
COMMISSIONER

IN THE MATTER OF

MAINE STATE PLANNING OFFICE	)	SOLID WASTE ORDER AND
CARPENTER RIDGE LANDFILL	)	NATURAL RESOURCES
T2R8 NWP, PENOBSCOT COUNTY, MAINE	)	PROTECTION ORDER AND
SPECIAL WASTE LANDFILL	)	WATER QUALITY
S-021372-WD-A-N	)	CERTIFICATION
(APPROVAL WITH CONDITIONS)	)	NEW LICENSE

Pursuant to the provisions of 38 M.R.S.A. Section 1301 *et seq.* (the "Waste Management Act"), 38 M.R.S.A. Section 480-A *et seq.* (the Natural Resources Protection Act), 33 U.S.C. Section 1341 (Section 401 of the Federal Water Pollution Control Act), and the regulations adopted pursuant to these laws, the Board of Environmental Protection ("Board") has considered the application of the MAINE STATE PLANNING OFFICE ("SPO") with its supportive data, staff summary, agency review comments, public hearing transcripts, and other related materials on file and finds the following facts:

## I. APPLICATION SUMMARY

- A. Application: The applicant has applied to construct and operate a state owned secure landfill for the disposal of special wastes on the northwest side of Carpenter Ridge in T2R8 NWP (the "Carpenter Ridge Landfill"). The landfill is situated adjacent to a state regulated wetland.
- B. History: The site was formerly purchased from Sylvan Properties Company by Lincoln Pulp and Paper Company(Lincoln) for development as a landfill for their solid wastes. The SPO entered into an agreement with Lincoln (dated July 20, 1992) to cooperatively develop the site as a solid waste landfill. On August 24, 1993 a preliminary information report was submitted to the Department of Environmental Protection (the "Department") and on May 4, 1994, SPO and the Department held a pre-application meeting. On May 25, 1994 the department issued its determination that pursuant to 06-096 CMR 401.1(E)(3), the proposed Carpenter Ridge landfill and site are environmentally feasible for secure landfill development.
- C. Summary of Proposal: The applicant requests approval to construct and operate a secure landfill for the disposal of special wastes, approval under the Natural Resources Protection Act to construct the secure landfill adjacent to a state regulated wetland, and water quality certification under Section 401 of the Federal Water Pollution Control Act. The proposed site is on the northwest side

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MAINE STATE PLANNING OFFICE	2	SOLID WASTE ORDER AND
CARPENTER RIDGE LANDFILL	)	NATURAL RESOURCES
T2R8 NWP, PENOBSCOT COUNTY, MAINE	)	PROTECTION ORDER AND
SPECIAL WASTE LANDFILL	)	WATER QUALITY
S-021372-WD-A-N	)	CERTIFICATION
(APPROVAL WITH CONDITIONS)	)	NEW LICENSE

of Carpenter Ridge in T2R8 NWP. The highest point of the proposed 34.6 acre site will be elevation 385 feet, about 15 feet higher than the top of the ridge. About 20 additional acres will be developed for ancillary buildings and roads. The total land area owned around the facility site is about 1500 acres. Existing logging roads off Penobscot Valley Avenue will be improved to provide access from Interstate 95, exit 55. This facility is expected to provide 1.8 million cubic yards of disposal capacity over 18 years at a rate of 100,000 cubic yards per year.

The SPO is requesting variances from four siting and design provisions and two application requirements of the Solid Waste Management Rules, 06-096 CMR Chapters 400-409 (May 24, 1989). These six provisions are: 06-096 CMR 400.4(T), requiring that proof of liability insurance be submitted with the application; 06-096 CMR 400.10, requiring that a proposed trust agreement setting up an escrow account to cover closure and post-closure costs be submitted with the application. 06-096 CMR 401.1(D)(5)(b), requiring that the in-place surface material have a hydraulic conductivity of  $10E-5$  cm/sec; 06-096 CMR 401.1(G)(1)(g), requiring a calculated contaminant travel time of at least six years from the landfill monitoring wells to an underlying bedrock aquifer; 06-096 CMR 401.4(C)(1), requiring that the landfill base preparation grade (the bottom of the engineered liner system) be at least 10 feet above bedrock; 06-096 CMR 401.4(C)(7)(b)(iv), requiring a 5 year contract for leachate transportation to an approved leachate disposal facility.

The SPO's agreement with Lincoln permits the company to construct and operate a the landfill at the site for their needs should they need capacity which the SPO is not providing. If and when the SPO determines that capacity for public use is needed, it would buy out any cells built by Lincoln and assume responsibility for the company's waste as any other customer. License amendments needed before Lincoln could assume responsibility for the construction and operation of the facility must be sought by Lincoln Pulp and Paper Company.

MAINE STATE PLANNING OFFICE	3	SOLID WASTE ORDER AND
CARPENTER RIDGE LANDFILL	)	NATURAL RESOURCES
T2R8 NWP, PENOBSCOT COUNTY, MAINE	)	PROTECTION ORDER AND
SPECIAL WASTE LANDFILL	)	WATER QUALITY
S-021372-WD-A-N	)	CERTIFICATION
(APPROVAL WITH CONDITIONS)	)	NEW LICENSE

2. PUBLIC HEARING

The Board conducted a public hearing jointly held with the Land Use Regulation Commission (the "Commission") on the proposed Carpenter Ridge Landfill on August 3, 1995 in Lincoln, Maine. The Penobscot County Commissioners participated in the landfill licensing process as the "municipal intervenor". No other persons testified in the joint proceedings before the Board and the Commission.

The applicant and the Penobscot County Commissioners submitted pre-filed written testimony by July 19, 1995. While Waste Management Disposal Services and Sylvan Properties Company submitted written comments on the application, they did not petition the Board for status as an intervenor or participate in the joint hearing. The applicant's testimony focused on site geology, variance requests, the potential for any unforeseen releases of contaminants to ground and surface water, the applicant's policy on facility need and facility size, and host community benefits. The Penobscot County Commissioners used its \$50,000 intervenor assistance grant to focus its testimony primarily on issues of site geology and facility design through review of the application by Arnold Fessenden, consulting geologist, and Richard Wardwell, professional engineer. The Penobscot County Commissioners and its representatives concluded their testimony by stating their support of the landfill project. The applicant and the Penobscot County Commissioners were afforded the opportunity of cross examination at the hearing and the public was given an opportunity to testify in an evening session. Despite members of the public being present, no public testimony was offered.

3. FINANCIAL CAPACITY

The SPO has submitted a detailed financial statement consisting of cost estimates for capital costs to be incurred during landfill construction (\$22,529,000), annual operating costs (\$1,313,000), closure costs (\$4,928,000), and annual post-closure monitoring and maintenance costs (\$263,500). A time schedule for construction costs was included in volume IV of the application. The money to construct the landfill will be obtained through the issuance of revenue obligation securities as authorized by 38 M.R.S.A. Section 2213. The applicant has requested a variance from two application requirements of the Rules pursuant to 06-096 CMR 400.11(B) & (C). These provisions require an applicant to submit a proposed trust agreement setting up an escrow account to cover closure and post-closure care, and proof of liability insurance. 06-096 CMR 400.4(T) and 400.10. The applicant's financial ability to close and perform post closure maintenance

MAINE STATE PLANNING OFFICE	4	SOLID WASTE ORDER AND
CARPENTER RIDGE LANDFILL	)	NATURAL RESOURCES
T2R8 NWP, PENOBSCOT COUNTY, MAINE	)	PROTECTION ORDER AND
SPECIAL WASTE LANDFILL	)	WATER QUALITY
S-021372-WD-A-N	)	CERTIFICATION
(APPROVAL WITH CONDITIONS)	)	NEW LICENSE

for 30 years is governed by the state's ability to sell bonds. The SPO provided assurance that the revenue bonding authority of the Finance Authority of Maine (FAME) in 38 M.R.S.A. Section 2211 *et seq.* would be adequate to cover the full costs of the Carpenter Ridge facility including liability insurance, and closure and post-closure costs through a letter provided by Chief Executive Officer Timothy Agnew of FAME dated August 15, 1995. Mr. Agnew described in detail how the available \$50,000,000 "moral obligation" credit enhancement mechanism would facilitate the sale of these public bonds and reduce the interest rate, and further how the bond proceed disbursements would be controlled by FAME assuring that the funds were used only for eligible purposes. Thus, the Board finds that the applicant has presented sufficient evidence demonstrating that the statutory mechanism for financing liability insurance and closure and post-closure care costs comply with the intent of 06-096 CMR 400.4(I) and 400.10, and that the applicant has the financial capacity to undertake this project consistent with the state's environmental regulations and laws.

4. TECHNICAL ABILITY

The SPO has no experience with operating or constructing landfills. In order to insure that the landfill will be constructed and operated in accordance with its license and applicable regulations the SPO will contract with qualified persons to provide those services. The qualifications required of persons contracted by the SPO to construct and operate the landfill will be subject to the Department's review and approval of the operations plan as stated in special condition nine(9). In the siting and application process SPO has contracted with the following persons for the listed services:

- A. Robert G. Gerber, Inc. of Freeport, Maine (hydrogeologic analysis and project management and technical support for the applicant).
- B. Woodard and Curran, Inc. of Portland, Maine (engineering design and construction oversight).
- C. Caswell, Eichler and Hill, Inc. of Portsmouth, New Hampshire (landfill siting studies).
- D. Eco-Analysts, Inc. of Woolwich, Maine (natural resource assessment).
- E. Eaton Traffic Engineering, Inc. of Brunswick, Maine (traffic impact studies).

MAINE STATE PLANNING OFFICE	5	SOLID WASTE ORDER AND
CARPENTER RIDGE LANDFILL	)	NATURAL RESOURCES
T2R8 NWP, PENOBSCOT COUNTY, MAINE	)	PROTECTION ORDER AND
SPECIAL WASTE LANDFILL	)	WATER QUALITY
S-021372-WD-A-N	)	CERTIFICATION
(APPROVAL WITH CONDITIONS)	)	NEW LICENSE

- F. H. Dominie, Inc. of Manchester, Maine (visual impact analysis).
- G. Resource Systems Engineering, Inc. of Brunswick, Maine (sound impact studies and financial feasibility planning).
- H. Henry Warren dba Pleasant Valley Associates of Cape Elizabeth, Maine (project management lead)

All these firms have expertise in the areas of this project on which they worked.

5. PUBLIC BENEFIT AND RECYCLING

As a state-owned facility, the proposed landfill is not subject to the public benefit criteria of the Waste Management Act, and therefore need not demonstrate consistency with the state waste management and recycling plan.

However, the applicant has been directed by statute to identify solid waste disposal capacity sufficient to meet the projected needs of the state. SPO has identified a capacity need for the disposal of special waste based on the limited available capacity, the uncertain rate at which the available capacity will diminish in the future, and the statutory prohibition on the development of commercial landfill space. SPO further asserts that because of the difficulty, expense, and time involved in the development of a new landfill, the necessary permits and licenses must be in hand prior to any decision to build the landfill.

The SPO's decision to construct will be identified by evaluating market conditions, and on projections of special waste disposal capacity two years beyond the measurement point. The SPO will consider constructing the facility when total available capacity is less than 90% of the current year's waste volume being shipped to commercial facilities or when agreements with generators which assure the delivery of sufficient waste to provide for economically viable operation of the facility are in place.

SPO is subject to the requirement that the volume of waste and the risks related to its handling and disposal be reduced to the maximum practical extent by recycling and source reduction prior to disposal, therefore a standard condition implementing this requirement is included in this license.

MAINE STATE PLANNING OFFICE	6	SOLID WASTE ORDER AND
CARPENTER RIDGE LANDFILL	)	NATURAL RESOURCES
T2R8 NWP, PENOBSCOT COUNTY, MAINE	)	PROTECTION ORDER AND
SPECIAL WASTE LANDFILL	)	WATER QUALITY
S-021372-WD-A-N	)	CERTIFICATION
(APPROVAL WITH CONDITIONS)	)	NEW LICENSE

6. COMPLIANCE

The applicant has no record of civil or criminal violations of environmental law.

7. SITE LOCATION

A. Site Description:

The Carpenter Ridge landfill site is located in the unorganized Township of T2R8 in Penobscot County, approximately two miles west of Exit 55 on Interstate 95. To the east of the interstate lie the Penobscot River and the Town of Lincoln. The site is generally isolated from habitation and other development.

The landfill is proposed to be developed on the north slope of Carpenter Ridge, a till mantled bedrock promontory. At the site of the proposed landfill, Carpenter Ridge is characterized by variably fractured, fine grained metasedimentary bedrock overlain by up to about 20 feet of gray and brown till. Brown till is typically exposed at the ground surface and is underlain by gray till over much of the site. At locations where both brown and gray tills are present, their relative thicknesses are variable. The proposed landfill is not located over or near a significant ground water aquifer.

South Branch Stream, the nearest body of perennial surface water, is 3000 feet from the proposed landfill footprint. South Branch Stream is an outlet of South Branch Lake and flows generally east to northeast to its confluence with Mattamiscontis Stream, a tributary to the Penobscot River. Wetlands associated with South Branch Stream occupy extensive areas north and west of the site. Another, smaller wetland is located immediately east of the proposed landfill footprint. Small, poorly organized intermittent streams may be discerned within this wetland. This drainage becomes channalized at the wetland's northern outlet but becomes diffused again and is lost in the larger wetland associated with South Branch Stream.

MAINE STATE PLANNING OFFICE	7	SOLID WASTE ORDER AND
CARPENTER RIDGE LANDFILL	)	NATURAL RESOURCES
T2R8 NWP, PENOBSCOT COUNTY, MAINE	)	PROTECTION ORDER AND
SPECIAL WASTE LANDFILL	)	WATER QUALITY
S-021372-WD-A-N	)	CERTIFICATION
(APPROVAL WITH CONDITIONS)	)	NEW LICENSE

Sand and gravel deposits form major eskers both east and west of Carpenter Ridge. The esker to the east of the proposed landfill site is approximately 3000 feet distant. Another major esker is located about three miles to the west. These eskers are part of a larger esker system which approaches the Penobscot Valley from the northwest and continues south towards Penobscot Bay.

B. Traffic Movement:

The proposed landfill is expected to generate about 102 vehicle trips on an average day and 160 on a peak day. All roads in the vicinity of the site that may be used by the newly generated traffic have sufficient capacity to accommodate this increase with no significant decrease in level of service provided.

Additionally, evaluation of the accident history does not indicate any clear operational or physical deficiencies that would constitute a safety hazard. The applicant proposes to instruct all customers transporting waste to the landfill to use the interstate rather than the state highway system with it's heavier allowed payload.

Other road users can be expected to encounter greater truck traffic over a short section of access road accessible to the public. However, the impact to other users should be minimal as the access road will be improved to a width of 30 feet.

C. Natural Environment:

The SPO received a permit (L-018726-L4-A-N) on September 30, 1994 under the Natural Resources Protection Act for reconstruction of the crossing of Mattamiscontis Stream and other culvert replacements along the access road to the facility. The landfill facility does not directly impact any protected natural resource but is adjacent to state regulated wetlands.

D. Scenic Character and Existing Uses:

The sixty acre landfill facility site lays within a 1500 acre parcel owned by the applicant and is not visible from established public viewing areas and will not significantly limit existing recreational and commercial uses. To ensure that the landfill does not become visible through tree cutting, the SPO proposes to regulate tree cutting on it's parcel through a management plan developed by it's consultants.

MAINE STATE PLANNING OFFICE	8	SOLID WASTE ORDER AND
CARPENTER RIDGE LANDFILL	)	NATURAL RESOURCES
T2R8 NWP, PENOBSCOT COUNTY, MAINE	)	PROTECTION ORDER AND
SPECIAL WASTE LANDFILL	)	WATER QUALITY
S-021372-WD-A-N	)	CERTIFICATION
(APPROVAL WITH CONDITIONS)	)	NEW LICENSE

E. Surface Water Quality:

Surface water quality data was not obtained as part of the applicant's hydrogeologic investigation since the nearest downgradient surface water body (South Branch Stream) is 3000 feet distant and is not expected to be affected by the landfill.

F. Natural Resources:

No unusual natural resources other than a deer wintering area has been found in the vicinity of the landfill facility. The deer yard is located on the north and west sides of the proposed landfill approximately 400 feet distant from the perimeter road around the toe of the landfill.

G. Erosion Control:

The SPO has submitted a erosion and sedimentation control plan for landfill construction and operation. The implementation of the plan will prevent any adverse effects to the adjacent wetlands.

H. Ground Water Quality:

Ground water quality data was obtained from 21 ground water monitoring wells in and around the proposed landfill footprint in 1993, and from five wells in and around the proposed landfill in 1988. The earlier samples were analyzed for a wide range of constituents. The more recent analysis was limited to common, major ground water constituents. Ground water quality is typical for the local geologic media and there is no indication of contamination from any source. The ground water quality has not yet been sufficiently characterized to support future statistical comparisons with pre-development ground water quality. The applicant proposes to fully characterize ground water quality prior to operation of the landfill.



MAINE STATE PLANNING OFFICE	9	SOLID WASTE ORDER AND
CARPENTER RIDGE LANDFILL	)	NATURAL RESOURCES
T2R8 NWP, PENOBSCOT COUNTY, MAINE	)	PROTECTION ORDER AND
SPECIAL WASTE LANDFILL	)	WATER QUALITY
S-021372-WD-Å-N	)	CERTIFICATION
(APPROVAL WITH CONDITIONS)	)	NEW LICENSE

I. Utilities:

The applicant proposes to provide sufficient and healthful water by means of a combination of a drilled well and bottled water. Power will be provided by public electric service and sewage by a permitted septic and leach field.

J. Flooding:

No portion of the facility site is within a 100 year flood plain.

K. Other:

The construction and operation of the proposed landfill will not have any adverse effects on air quality, access to sunlight, sound levels, historic sites, or climate and will not cause offensive odors.

8. VARIANCES TO SITING AND DESIGN

The applicant has requested four variances from the siting and design requirements of the rules pursuant to 06-096 CMR 400.11(A)

- A. The applicant has requested a variance to the hydraulic conductivity standard of CMR 401.1 (D) (5) (b), which requires that in-place surficial materials have a hydraulic conductivity of less than  $10E-5$  cm/sec. The average in-place hydraulic conductivity of soils within the proposed landfill footprint is slightly greater than the regulatory maximum. The till in many areas is less permeable, but in some areas exceeds  $10E-4$  cm/sec. The intent of the hydraulic conductivity standard is to help insure longer travel times of a contaminant front to a receptor of concern. Since the most probable discharge point of any contaminant originating at the Carpenter Ridge Landfill is the wetland within the property owned by the SPO, and because the travel paths between the landfill and the discharge points are long and predictable, and because the observed low hydraulic gradients contribute to long travel times, the Board finds that the applicant has presented clear and convincing evidence that the local exceedances of the hydraulic conductivity standard are mitigated by these other site characteristics, and that these characteristics collectively meet the intent of CMR 401(D)(5)(b).

MAINE STATE PLANNING OFFICE	10	SOLID WASTE ORDER AND
CARPENTER RIDGE LANDFILL	)	NATURAL RESOURCES
T2R8 NWP, PENOBSCOT COUNTY, MAINE	)	PROTECTION ORDER AND
SPECIAL WASTE LANDFILL	)	WATER QUALITY
S-021372-WD-A-N	)	CERTIFICATION
(APPROVAL WITH CONDITIONS)	)	NEW LICENSE

- B. The applicant has requested a variance to the travel time standard of CMR 401.1(G)(1)(G), which requires a calculated contaminant travel time of greater than six years to an underlying fractured bedrock aquifer. The intent of this standard is to insure a minimum level of protection for a fractured bedrock aquifer which may be a ground water resource. Contaminant travel times from the landfill to bedrock are variable at this site, and depend on the location of the assumed leak. Many of the potential flow paths do not encounter bedrock at all, so that the standard in question does not apply. Portions of the landfill however do have calculated travel times to bedrock of between two and six years. To compensate for this site limitation, the applicant has proposed improvements to the design and operation of the landfill. These improvements include the addition of a composite liner system and the addition and monitoring of a leak detection system. The Board finds that the applicant has presented clear and convincing evidence that the proposed improvements to the design and operation of the landfill compensate for up to four years of reduced travel time and collectively meet the intent of CMR 401(G)(1)(G).
- C. The applicant has requested a variance to the design standard of CMR 401.4(C)(1), which requires that base preparation grade for the landfill shall be a minimum of 10 feet above bedrock. The thickness of natural, in place geologic material over approximately 80% of the proposed landfill footprint meets or exceeds this requirement. Over the remaining area, bedrock occurs between five and ten feet below the ground surface. The intent of this standard is to provide a natural geologic backup to the engineered system. The applicant proposes to place fill material in sufficient quantity to provide a ten foot separation to bedrock over those areas which do not meet the minimum standard. The fill material will meet the hydraulic permeability standard of CMR 401.1(D)(5)(b) and will be placed in lifts and compacted to eliminate the potential for preferential flow paths. The Board finds that the applicant has presented clear and convincing evidence that placing the appropriate soil material according to appropriate engineering specifications to meet the standard meets the intent of CMR 401.4(C)(1).
- D. The applicant has requested a variance to 06-096 CMR Chapter 401 Section 4(C)(7)(b)(iv), the regulation that requires sufficient leachate management provisions by use of a 5 year contract for off-site leachate disposal at a licensed facility. Although the SPO has provided letters of intent for the off-site disposal

MAINE STATE PLANNING OFFICE	11	SOLID WASTE ORDER AND
CARPENTER RIDGE LANDFILL	)	NATURAL RESOURCES
T2R8 NWP, PENOBSCOT COUNTY, MAINE	)	PROTECTION ORDER AND
SPECIAL WASTE LANDFILL	)	WATER QUALITY
S-021372-WD-A-N	)	CERTIFICATION
(APPROVAL WITH CONDITIONS)	)	NEW LICENSE

of leachate, at the present time the SPO does not project the need for the landfill for in excess of 5 years. The Board finds that the applicant has presented clear and convincing evidence that having a contract for leachate prior to beginning landfill construction is sufficient to meet the intent of 06-096 CMR 401.4(C)(7)(b)(iv).

9. ENGINEERING DESIGN

- A. Liner and Leachate Management System Design: The liner system design for the 34.6 acre landfill is a double composite liner system. The 34.6 acre site is divided into 11 cells, with additional subdivisions within cells 4, 5, and 6 to reduce the amount of leachate generated during operations. The primary liner consists of an 80-mil textured High Density Polyethylene (HDPE) liner in direct contact with a Geosynthetic Clay Liner (GCL). The secondary liner consists of an 80-mil textured HDPE liner in direct contact with three feet of recompacted clay with a hydraulic conductivity of  $10E-7$  cm/sec.

The primary and secondary leachate collection and removal systems consist of a 12 inch sand layer over a drainage geocomposite. Each landfill cell has an independent leachate collection and removal system, and will be monitored separately. The 12 inch sand layer in the primary system has 6 inch HDPE pipes spaced at 100 feet on center. These pipes are connected to a 12 inch HDPE header pipe located along the western perimeter berm. The 12 inch sand layer in the secondary system has a single 6 inch diameter HDPE header pipe along the western perimeter berm of each cell. The header pipes drain to collection sumps where the leachate is pumped out of each landfill cell for transport to the leachate storage ponds. Submersible pumps are placed on skids in a 24 inch diameter HDPE pipe that extends into the sump for both the primary system and the secondary system. Two pumps are used for the primary system (primary and primary back-up). One pump is used for the secondary system with an alarm to indicate pump failure. The leachate is pumped out of each cells' primary and secondary collection and removal systems into a common leachate transport pipe. The transport pipe is a dual containment system of HDPE pipe. The interior or carrier pipe is an 8 inch diameter HDPE pipe, and the exterior or containment pipe is a 12 or 14 inch HDPE pipe. Leakage from the carrier pipe will be detected through monitoring of the containment pipe. The transport system remains a closed system (hard-piped through all manhole structures) until it is connected to manholes MH 1 and MH 2, which are wetwells for the leachate

MAINE STATE PLANNING OFFICE	12	SOLID WASTE ORDER AND
CARPENTER RIDGE LANDFILL	)	NATURAL RESOURCES
T2R8 NWP, PENOBSCOT COUNTY, MAINE	)	PROTECTION ORDER AND
SPECIAL WASTE LANDFILL	)	WATER QUALITY
S-021372-WD-A-N	)	CERTIFICATION
(APPROVAL WITH CONDITIONS)	)	NEW LICENSE

storage ponds. Adjacent to MH 1, MH 2, and the leachate ponds are pump stations #1 and #2, which are submersible pump stations associated with leak detection systems of each of the leachate storage ponds. Pump stations #1 and #2, and MH 1 and MH 2, are HDPE since they will contain leachate within the actual structure.

Two leachate storage ponds, with a combined design capacity of 1,375,000 gallons, will be used. The design capacity is based on the requirements of Section 401.4(C)(7)(b) of the Solid Waste Management Rules and letters of intent to provide leachate treatment from several waste water treatment facilities. The pond liner system consists of an 80-mil HDPE primary liner, a synthetic drainage net for leak detection, and a secondary composite liner. The secondary composite liner consists of an 80-mil HDPE liner in direct contact with three feet of recompacted clay with a hydraulic conductivity of  $10E-7$  cm/sec. The two ponds are connected with ancillary piping such that leachate can be pumped from one pond to the other for routine maintenance, inspection, and repair of the liner. The leachate in the storage ponds will be pumped into tank trucks at the Leachate Pumping Building and disposed of at a licensed waste water treatment plant.

Contracts for disposal of leachate have not been secured by the applicant. The applicant has requested a variance to the requirements for a sewerage service and transport contract as required by Section 401.4(C)(7)(b)(iv) of the Solid Waste Management Rules. Once a sewerage service and transport contract is finalized prior to final design and construction of Phase 1 of this facility, the leachate storage pond sizing calculations must be verified to ensure that adequate capacity exists to meet the requirements of Section 401.4(C)(7)(b) of the Solid Waste Management Rules.

- B. Construction Quality Assurance Plan: A construction quality assurance plan (QAP) has been developed for this project. The QAP outlines procedures specific to the construction of the geosynthetic and soil portions of the project. The plan consists of the Geosynthetics Quality Assurance Plan and the Soils Quality Assurance Plan. An independent, third party inspection firm will be retained by the applicant to provide construction quality assurance services related to the geomembrane installation. This independent, third party inspection firm will be selected prior to construction of Phase I.

MAINE STATE PLANNING OFFICE	13	SOLID WASTE ORDER AND
CARPENTER RIDGE LANDFILL	)	NATURAL RESOURCES
T2R8 NWP, PENOBSCOT COUNTY, MAINE	)	PROTECTION ORDER AND
SPECIAL WASTE LANDFILL	)	WATER QUALITY
S-021372-WD-A-N	)	CERTIFICATION
(APPROVAL WITH CONDITIONS)	)	NEW LICENSE

C. Record Drawings and Final Construction Certification: The applicant proposes to construct the landfill in four phases and provide final cover for each phase as final grades are reached and the next phase is constructed. The applicant has not proposed to submit record drawings in accordance with 401.5(F) and a final construction certification and report in accordance with 401.5(H) for each phase of construction.

D. Storm water Run-on/Runoff Control Plan: Storm water run-on/runoff will be controlled by the construction of a perimeter berm around the landfill perimeter. The perimeter berm will contain leachate and contaminated runoff within the landfill collection system and prevent surface water from flowing into the landfill area. The berm will be constructed a minimum of three feet higher than the elevation of the liner system. Cell division berms will also be constructed within the landfill area to separate the landfill into cells. Clean water that is collected in the inactive cells will be pumped out of the cells by the leachate pumping system. The piping configuration in the leachate collection structures allow clean water to be pumped out of the landfill into the drainage channels located outside of the lined area. Once the cell becomes active, the valve which allows the clean water to be directed outside the lined area will be closed, and the leachate will be pumped into the leachate transport pipe.

The applicant proposes to use operational final cover (OFC) on areas of the landfill that are at final grades but are not yet closed out with final cover. The OFC will prevent clean water from being treated as leachate. Clean water will runoff the OFC and into slope benches and down drain channels. Slope benches will be spaced approximately every 75-100 feet of slope length, and will direct the runoff to the down drain channels. The down drain channels will then discharge the clean Storm water to the drainage channels located outside of the perimeter berm of the landfill.

## 10. STABILITY

The applicant performed stability analyses for the proposed landfill that showed that the factors of safety are acceptable to fill to the proposed grades. The analyses included both static and seismic conditions, using a combination of site-specific data and general data from manufacturer's literature. The applicant's geotechnical consultant provided several recommendations, in a geotechnical evaluation report dated February 14, 1995, for implementation prior to, and during, landfill operations. These recommendations include

MAINE STATE PLANNING OFFICE	14	SOLID WASTE ORDER AND
CARPENTER RIDGE LANDFILL	)	NATURAL RESOURCES
T2R8 NWP, PENOBSCOT COUNTY, MAINE	)	PROTECTION ORDER AND
SPECIAL WASTE LANDFILL	)	WATER QUALITY
S-021372-WD-A-N	)	CERTIFICATION
(APPROVAL WITH CONDITIONS)	)	NEW LICENSE

interface friction testing for soils and geosynthetics, creation of a geotechnical monitoring plan, and re-evaluation of the stability analysis performed during license review once the as-constructed soil strength properties and interface friction results are known. The Board concurs with the analyses provided the recommendations from the February 14, 1995 geotechnical evaluation report are implemented.

## 11. MONITORING AND REPORTING REQUIREMENTS

- A. Ground and surface water monitoring and reporting: The applicant has proposed the phased installation and monitoring of seventy-five ground water monitoring wells at thirty-nine locations. Well pairs, or clusters, are proposed at most locations where ground water occurs both in the bedrock and in the overlying till. Of the thirty-nine ground water monitoring locations, twenty-three are downgradient of the landfill and thirteen well locations are upgradient or cross gradient of the landfill. Three monitoring well pairs are located downgradient of the proposed leachate ponds. Due to the size and shape of the landfill footprint, and because development of the landfill will occur in phases from north to south, the applicant proposes installation of the monitoring wells in two phases timed to future development. In addition to obtaining samples of ground water for analysis, the applicant proposes a semi-annual terrain conductivity survey along a fixed circumferential circuit in mid-April and mid-October of each year.

The applicant proposes to monitor surface water at two locations in the small stream system within the wetland immediately east of the landfill site and at the continuation of that stream further to the north near the north access road.

- B. Leachate monitoring and reporting: The applicant's leachate monitoring plan proposes to monitor quantity and quality of leachate flow and sediment accumulations in the leachate collection, transport, and storage system. The plan consists of four parts:

- (1) leachate flow monitoring which measures the flow rates within the primary and secondary collection systems of the landfill and leak detection system of the leachate storage ponds. Leachate flows in each cell are evaluated to determine the performance of the landfill and leachate collection pond liner systems and, based on predetermined action leakage rates, may trigger appropriate actions in response to measured leakage values:

MAINE STATE PLANNING OFFICE	15	SOLID WASTE ORDER AND
CARPENTER RIDGE LANDFILL	)	NATURAL RESOURCES
T2R8 NWP, PENOBSCOT COUNTY, MAINE	)	PROTECTION ORDER AND
SPECIAL WASTE LANDFILL	)	WATER QUALITY
S-021372-WD-A-N	)	CERTIFICATION
(APPROVAL WITH CONDITIONS)	)	NEW LICENSE

- (2) leachate quality monitoring which determines chemical characteristics of the leachate;
- (3) leachate storage residue monitoring which characterizes leachate storage pond sludge/sediment; and
- (4) leachate sampling and analytical work plan which describes sampling, quality control/quality assurance procedures, analytical methods, and quarterly and annual reporting to the department.

C. Geotechnical monitoring and reporting: The applicant's geotechnical consultant recommended that a geotechnical monitoring plan be developed to ensure that stable conditions are maintained during landfill operations. The applicant has not prepared a geotechnical monitoring plan for review by the Department.

## 12. WASTE STREAMS AND CHARACTERIZATION

- A. Special waste identification, handling, and disposal: The applicant has proposed steps to be taken by the operations staff with respect to acceptance or rejection of waste and procedures relating to exclusion and handling of unacceptable waste.
- B. Waste sampling and analytical work plan: The applicant has proposed waste sampling and analysis protocols to assure that waste received at the landfill will be non-hazardous and acceptable for disposal. These protocols provide for landfill technical staff to review information which characterize certain wastes and to accept or exclude the wastes based on their review. Wastes subject to those protocols are pulp and paper mill waste water treatment sludges, municipal waste water treatment sludges, ash, and non-recoverable oily waste. Other special wastes may only be accepted for disposal based on a case by case review and approval by the Department.

## 13. OPERATIONS

As part of the original application, the applicant submitted an operations manual for this facility. Revisions to the manual, dated February 9, 1995, were made to address comments of Department staff. Revisions made to the project during final design and construction, as well as finalization of the action leakage rate/response action plan, need to be incorporated into the manual before the landfill commences operations.

MAINE STATE PLANNING OFFICE	16	SOLID WASTE ORDER AND
CARPENTER RIDGE LANDFILL	)	NATURAL RESOURCES
T2R8 NWP, PENOBSCOT COUNTY, MAINE	)	PROTECTION ORDER AND
SPECIAL WASTE LANDFILL	)	WATER QUALITY
S-021372-WD-A-N	)	CERTIFICATION
(APPROVAL WITH CONDITIONS)	)	NEW LICENSE

The applicant proposed an Operational and Closing Sequence Plan (OCSP), showing a detailed sequence of landfill development for the first 4 years of operation (cells 1-3). Conceptual development plans were shown for the remaining life of the facility. The OCSP is coordinated with the leachate generation estimates, stability analyses, phased closure plans, and capacity needs. Significant changes in these parameters may require modifications to the OCSP. Detailed plans for years subsequent to the first 4 years of operation will be developed as part of the required annual report submission, including any modifications necessitated by changes in the parameters outlined above.

The applicant has proposed a detailed, facility-specific inspection, maintenance, and record keeping and reporting program. The program combines daily, weekly, monthly, quarterly, and annual inspection and maintenance tasks.

#### 14. LANDFILL CLOSURE

The applicant proposes to submit a complete closure plan to the Department at least one year prior to the start of any final closing operations. The applicant proposes to close out phases of the landfill that have reached capacity as new phases are constructed. The applicant has prepared a conceptual closure design that includes a composite landfill cover. The applicant has not prepared a closing plan, including design documents, bid-ready construction documents, and a QAP, for phased construction of the cover system components.

BASED on the above Findings of Facts, and subject to the Conditions listed below, the Board makes the following CONCLUSIONS:

1. The proposed activity will not unreasonably inhibit the natural transfer of soil from the terrestrial to the marine or freshwater environment.
2. The proposed activity will not unreasonably harm any significant wildlife habitat, aquatic habitat, travel corridor, freshwater, estuarine, or marine fisheries or other aquatic life.
3. The proposed activity will not unreasonably harm any freshwater wetland plant habitat.
4. The proposed activity will not unreasonably interfere with the natural flow of any surface or subsurface waters.



MAINE STATE PLANNING OFFICE	17	SOLID WASTE ORDER AND
CARPENTER RIDGE LANDFILL	)	NATURAL RESOURCES
T2R8 NWP, PENOBSCOT COUNTY, MAINE	)	PROTECTION ORDER AND
SPECIAL WASTE LANDFILL	)	WATER QUALITY
S-021372-WD-A-N	)	CERTIFICATION
(APPROVAL WITH CONDITIONS)	)	NEW LICENSE

5. The proposed activity will not unreasonably cause or increase the flooding of the alteration area or adjacent properties or create an unreasonable flood hazard to any structure.
6. The proposed activity is not on or adjacent to a sand dune.
7. The proposed activity is not on an outstanding river segment as identified in Title 38 M.R.S.A., Section 480-P.
8. The proposed activity will not violate any state water quality law including those governing the classifications of the State's waters;
9. The construction and operation of the Carpenter Ridge Landfill as proposed by the SPO will not pollute any water of the State, contaminate the ambient air, constitute a hazard to health or welfare, or create a nuisance;
10. The SPO has provided adequate evidence of financial capacity and technical ability to meet air and water pollution control standards;
11. The SPO has made adequate provision for solid waste disposal, control of offensive odors, and the securing and maintenance of sufficient and healthful water supplies in that a double composite liner with leachate collection, leak detection, and leachate management is proposed;
12. The applicant has made adequate provision for traffic of all types into, out of, and within the project area provided that no significant quantity of traffic access the facility from State highways;
13. The applicant has made adequate provision for fitting the development harmoniously into the existing natural environment and the development will not adversely affect existing uses, scenic character, or natural resources in the municipality or in neighboring municipalities provided that a tree growth management plan is followed to maintain visual buffer;

MAINE STATE PLANNING OFFICE	18	SOLID WASTE ORDER AND
CARPENTER RIDGE LANDFILL	)	NATURAL RESOURCES
T2R8 NWP, PENOBSCOT COUNTY, MAINE	)	PROTECTION ORDER AND
SPECIAL WASTE LANDFILL	)	WATER QUALITY
S-021372-WD-A-N	)	CERTIFICATION
(APPROVAL WITH CONDITIONS)	)	NEW LICENSE

14. The proposed facility will be built on soil types which are suitable to the nature of the landfill and will not cause unreasonable soil erosion provided that SPO employs all erosion and sedimentation control measures in conformance with the requirements of the "Maine Erosion and Sediment Control Handbook for Construction: Best Management Practices" and implements the sedimentation control measures as proposed in its application;
15. The proposed landfill will not pose an unreasonable risk that a discharge to a significant ground water aquifer will occur in that the facility is not located over or near a significant ground water aquifer, and does not pose an unreasonable threat to the quality of the underlying fractured bedrock aquifer, in that the underlying soils together with the enhanced engineered safeguards proposed in the facility's design provide the equivalent of six years time of travel for contaminants from the landfill to bedrock, and that bedrock located at a lesser distance is outside the footprint of the landfill and will be removed during construction;
16. The SPO has no civil or criminal record of violations of environmental law;
17. The proposed landfill is not subject to the public benefit criteria imposed by state law;
18. The applicant has made adequate provision for utilities including water supplies, sewerage, solid waste and roadways, and the proposed landfill will not have an unreasonable adverse effect on the existing or proposed utilities and roadways in the areas served by those services.

THEREFORE, the Department APPROVES the six variance requests described in the findings of fact above, and the application of the MAINE STATE PLANNING OFFICE, to construct and operate the Carpenter Ridge Landfill in T2R8 NWP, Penobscot County, Maine SUBJECT TO THE FOLLOWING CONDITIONS AND ALL APPLICABLE STANDARDS AND REGULATIONS:

1. Standard Conditions of Approval, except that standard condition #6 does not apply, a copy attached as Appendix A.

MAINE STATE PLANNING OFFICE	19	SOLID WASTE ORDER AND
CARPENTER RIDGE LANDFILL	)	NATURAL RESOURCES
T2R8 NWP, PENOBSCOT COUNTY, MAINE	)	PROTECTION ORDER AND
SPECIAL WASTE LANDFILL	)	WATER QUALITY
S-021372-WD-A-N	)	CERTIFICATION
(APPROVAL WITH CONDITIONS)	)	NEW LICENSE

2. At least 30 days prior to construction of the landfill liner system, the applicant must submit the results of the geotechnical interface friction testing program for the soil and geosynthetic liner components, and landfill subgrade material testing referenced in the application's "Technical Specifications" Div. 2, Section 02200R3 to the Department for review and approval.
3. At least 30 days prior to construction, the applicant must submit the qualifications of the independent construction quality assurance personnel for the soils and geosynthetics components of construction. This condition applies to each phase of new landfill cell construction and to each phase of the final cover system construction.
4. At least 60 days prior to construction of each phase, the applicant must submit design documents, bid-ready plans, specifications, and a construction quality assurance plan for review and approval. This condition applies to each phase of new landfill cell construction and to each phase of the final cover system construction.
5. The applicant must submit construction contract change orders to the Department for review and approval. If the Department does not respond within five working days of receipt of the change order, approval is automatically granted. This condition applies to each phase of new landfill cell construction and to each phase of the final cover system construction.
6. Record drawings, and a construction certification and report, must be submitted in accordance with the requirements of Section 401.5(F) and 401.5(H) of the Solid Waste Management Rules. This condition applies to each phase of new landfill cell construction and to each phase of the final cover system construction.
7. At least 60 days prior to landfill operation, the applicant must submit a revised stability analysis and a geotechnical monitoring plan to the Penobscot County Commissioners and the Department for review and comment. The revised stability analysis must incorporate actual soil strength properties and interface friction testing results obtained during construction. The geotechnical monitoring plan must include provisions for monitoring of water levels within the waste during operations, monitoring of pore water pressures during landfill startup to ensure that excess pore water pressure is not creating an unstable condition, and methods for determining waste strength properties during land filling for comparison to the minimum design values presented in the application documents.

MAINE STATE PLANNING OFFICE	20	SOLID WASTE ORDER AND
CARPENTER RIDGE LANDFILL	)	NATURAL RESOURCES
T2R8 NWP, PENOBSCOT COUNTY, MAINE	)	PROTECTION ORDER AND
SPECIAL WASTE LANDFILL	)	WATER QUALITY
S-021372-WD-A-N	)	CERTIFICATION
(APPROVAL WITH CONDITIONS)	)	NEW LICENSE

8. At least 30 days prior to landfill operation, the applicant must submit a sewerage service and transport contract in accordance with the requirements of Section 401.4(C)(7)(b)(iv) of the Solid Waste Management Rules. The applicant must also submit verification that the leachate storage pond capacity meets the requirements of Section 401.4(C)(7)(b) of the Solid Waste Management Rules based on the disposal limitations, if any, of the selected leachate treatment facility.
  
9. At least 60 days prior to landfill operation, the applicant must submit a revised operations manual for the Department's review and approval. The revised manual must include the qualifications of the landfill operator and revisions made to the project during final design and construction, as well as finalization of the action leakage rate/response action plan.
  
10. At least one year prior to the start of any final closing operations, the applicant shall submit a complete closing plan to the Department for review and approval. At the time of application for final closure of this landfill, the Department may require changes or modifications to any final cover system approved during operation, depending on site and landfill performance.
  
11. At least six months, and if possible, two years prior to the start of any land clearing at the site, downgradient monitoring wells MW-401 through MW-419 and upgradient wells MW-430 through MW-439, located and constructed as proposed in Volume VII of the application shall be installed. Within two weeks of their installation, performance testing of these wells shall be conducted to determine the rate each well can be pumped without causing significant draw down of the water in the well.
  
12. Within sixty days of the installation of the monitoring wells listed in Condition 11, the boring logs, well installation details, and the results of the performance testing shall be incorporated into a revised sampling and analytical workplan. The revised workplan shall establish low-flow purge rates for each well based on the well performance evaluation, and shall be submitted for review and approval by the Department. Upon approval, the revised sampling and analytical workplan will be incorporated into the Environmental Monitoring Program for the facility.
  
13. After approval of the revised sampling and analytical workplan, and before any land clearing occurs at the site, Site Characterization Monitoring, as described in Volume VII of the application shall be conducted at each of the wells listed in Condition 11.

MAINE STATE PLANNING OFFICE	21	SOLID WASTE ORDER AND
CARPENTER RIDGE LANDFILL	)	NATURAL RESOURCES
T2R8 NWP, PENOBSCOT COUNTY, MAINE	)	PROTECTION ORDER AND
SPECIAL WASTE LANDFILL	)	WATER QUALITY
S-021372-WD-A-N	)	CERTIFICATION
(APPROVAL WITH CONDITIONS)	)	NEW LICENSE

14. Prior to the construction of any landfill cells south of the present PZ-14 location, the remainder of the wells proposed in Volume VII of the application shall be installed. Within two weeks of their installation, performance testing of these wells shall be conducted to determine the rate each well can be pumped without causing significant draw down of the water in the well. Within sixty days of the installation of the remaining wells, the boring logs, well installation details, and the results of the performance testing shall be incorporated into a revised sampling and analytical workplan. The revised workplan shall establish low-flow purge rates for each new well based on the well performance evaluation, and shall be submitted for review and approval by the Department. Upon approval, the revised sampling and analytical workplan will be incorporated into the Environmental Monitoring Program for the facility. After approval of the revised sampling and analytical workplan, and before construction of any landfill cells south of the present PZ-14 location, Site Characterization Monitoring, as described in Volume VII of the application shall be conducted at each of the wells installed under this Condition.
15. Prior to land filling of waste at the facility, the terrain conductivity survey transect shall be established and the initial survey conducted.
16. Prior to beginning construction of the landfill submit to the department for it's review and approval, a contract for the disposal of landfill leachate from the landfill for a term of not less than 5 years from the expected date of first accepting waste.
17. Prior to land filling waste at the facility, the tree growth management plan must be submitted to the department and be made part of the facilities operation plan.

MAINE STATE PLANNING OFFICE	22	SOLID WASTE ORDER AND
CARPENTER RIDGE LANDFILL	)	NATURAL RESOURCES
T2R8 NWP, PENOBSCOT COUNTY, MAINE	)	PROTECTION ORDER AND
SPECIAL WASTE LANDFILL	)	WATER QUALITY
S-021372-WD-A-N	)	CERTIFICATION
(APPROVAL WITH CONDITIONS)	)	NEW LICENSE

18. The applicant shall provide timely notice of all it's correspondance to the Department pertaining to the design, construction, closure, and post-closure maintenance of the landfill to the Penobscot County Commissioners and shall provide all information requested by the Penobscot County Commissioners in accordance with 38 M.R.S.A. Section 2174(2).

DONE AND DATED AT AUGUSTA, MAINE, THIS 24<sup>th</sup> DAY  
 OF April, 1996.

BOARD OF ENVIRONMENTAL PROTECTION

BY

  
 Owen R. Stevens, Chair

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON PETITION FOR RECONSIDERATION PROCEDURES

Date of initial receipt of application: 10-05-94

Date of application acceptance: 10-20-94

Date filed with Board of Environmental Protection

This Order was prepared by James S. Glasgow, Bureau of Remediation and Waste Management.

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