

# PLAN OF OPERATION COMPLETENESS CHECKLIST

## CHAPTER NR 514

Outline of Requirements for Plan of Operation Completeness Determination

Refer to Applicable Statutes and Codes for Exact Requirements

General Information

Facility Name: \_\_\_\_\_ License/Monitoring # \_\_\_\_\_

Facility Type: \_\_\_\_\_ FID# \_\_\_\_\_

Initial Submittal: Date Received: \_\_\_/\_\_\_/\_\_\_ Completeness Due: \_\_\_/\_\_\_/\_\_\_ DNR Response: \_\_\_/\_\_\_/\_\_\_ (Complete: \_\_ yes \_\_ no)

Addendum # \_\_ Date Received: \_\_\_/\_\_\_/\_\_\_ Completeness Due: \_\_\_/\_\_\_/\_\_\_ DNR Response: \_\_\_/\_\_\_/\_\_\_ (Complete: \_\_ yes \_\_ no)

Addendum # \_\_ Date Received: \_\_\_/\_\_\_/\_\_\_ Completeness Due: \_\_\_/\_\_\_/\_\_\_ DNR Response: \_\_\_/\_\_\_/\_\_\_ (Complete: \_\_ yes \_\_ no)

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Addendum # \_\_ Date Received: \_\_\_/\_\_\_/\_\_\_ Completeness Due: \_\_\_/\_\_\_/\_\_\_ DNR Response: \_\_\_/\_\_\_/\_\_\_ (Complete: \_\_ yes \_\_ no)

Proposed Waste Types: \_\_\_\_\_

Proposed Total Design Capacity: \_\_\_\_\_ (including daily and intermediate covers)

PLAN OF OPERATION REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
<b>NR 500.05 - GENERAL SUBMITTAL REQUIREMENTS</b>					
(1) Has the adequate review fee been submitted per NR 520.04?					
(2) Has a cover letter detailing the desired action been submitted?					
(3) Have 4 copies (3 Regions, 1 Central Office) and one electronic copy been submitted?					
(4) Has P.E. and P.G. certification been provided?					
(5) Technical Procedures:					
Were all technical procedures used to investigate the facility current standard procedures?					
Were all test procedures specified in the report?					
(6) Do all maps, plan sheets, drawings, isometrics, cross-sections, figures, photographs and tables meet the following requirements?					
(a) No larger than 30 inches x 42 inches & no smaller than 8 ½ inches x 11 inches.					

Facility Name: \_\_\_\_\_

PLAN OF OPERATION REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(b) Appropriate scale to show required detail.					
(c) Do visuals meet the following requirements? ___ numbered                      ___ legends for all symbols ___ referenced in the narrative    ___ horizontal & vertical scales ___ titled                            ___ drafting and origination dates					
(d) Are uniform scales used?					
(e) Are north arrows shown?					
(f) Is the mean sea level datum used as basis for all elevations?					
(g) Do visuals contain a survey grid based upon monuments established in the field?					
(h) Is the original topography and a grid system shown on the plan sheets that show construction, operation and closure topography?					
(i) Do cross-sections meet the following requirements? ___ Show survey grid locations ___ Reference major plan sheets ___ Include a reduced diagram of plan view showing cross-section location					
(7) Is a table of contents provided listing all sections of the submittal?					
(8) Is an appendix provided listing the following? ___ names of all references                      ___ all raw data, ___ testing and sampling procedures,        ___ calculations					
<b>NR 514.05 Engineering Plans</b>					
(1) Do plans include a title sheet?					
Does title sheet include the following?					
(a) Project title					
(b) Engineer/designer					
(c) Date plans prepared					
(d) Applicant					
(e) Table of contents					
(f) Site location maps and area served					
(2) Do plans include an existing conditions plan sheet?					
Does the existing conditions plan sheet show the following?					
• Detailed topographic map of the site and area within 1,500 feet of waste limits					
• Minimum scale of 1"= 200'					
• Maximum contour interval of 2'					
• Elevations related to U.S.G.S. datum					
(a) Surface waters including intermittent and ephemeral streams and wetlands					
(b) ___ Property boundaries                      ___ Proposed limits of waste ___ Proposed facility boundary					

Facility Name: \_\_\_\_\_

PLAN OF OPERATION REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(c) <input type="checkbox"/> North arrow <input type="checkbox"/> Landfill survey grid <input type="checkbox"/> Formula for converting survey grid to state plane coordinate system <input type="checkbox"/> Location of all existing and proposed survey monuments					
(d) Residential and commercial structures and other buildings					
(e) Location of the following within 1000 feet of the landfill or 500 feet of any monitoring well: <input type="checkbox"/> All soil borings <input type="checkbox"/> Existing and abandoned groundwater monitoring wells <input type="checkbox"/> Public and private water supply wells <input type="checkbox"/> General locations of all known septic systems and drain fields					
(f) Locations of other landfills, demolition landfills, or other solid waste facilities for processing, storage or composting of solid waste					
(g) Locations of utility lines, underground pipelines, electrical lines, access control, and other constructed topographic and drainage features					
(3) Do plans include sub-base grades and base grades plan sheets?					
Do the sub-base and base grades plan sheets depict? <input type="checkbox"/> Sub-base grades <input type="checkbox"/> Sub-base appurtenances such as lysimeters or drain pipes <input type="checkbox"/> Base grades					
(4) Do plans include engineering design features plan sheets? Do the engineering design features plan sheets include the following:					
(a) Separate plan sheet depicting total landfill area, limits of liner construction, and limits of filling					
(b) Plan sheet depicting layout and slopes of liner system					
(c) Plan sheet depicting layout and slopes of leachate collection system including: <input type="checkbox"/> Pipes <input type="checkbox"/> Sumps <input type="checkbox"/> Riser pipes on interior sideslopes <input type="checkbox"/> Manholes <input type="checkbox"/> Trenches <input type="checkbox"/> Berms <input type="checkbox"/> Lift stations <input type="checkbox"/> Permanent storm water control structures <input type="checkbox"/> Pipe cleanouts <input type="checkbox"/> Other pertinent structures					
(d) Plan sheet depicting invert elevations at change in grades for all leachate and groundwater collection and transfer systems					
(5) Do plans include phasing plan sheet(s) showing landfill development through time?					

Facility Name: \_\_\_\_\_

PLAN OF OPERATION REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(a) Do phasing plan sheets include peripheral features such as: ___ Support buildings      ___ Sedimentation basins ___ Access roads            ___ Other stormwater management features ___ Drainage ditches        ___ Screening berms					
(b) Do phasing plan sheets include separate plan sheets for initial facility construction and each subsequent phase of construction or new area where construction will be performed including: ___ Final filling surfaces in the previous phases ___ Limits of clearing, grubbing and topsoil removal ___ Base grades of new phase of filling ___ Anticipated contours of soil stockpiles at the time depicted ___ Storm water management features ___ List of construction items and quantities necessary to prepare each phase					
(6) Do plans include storm water management plan sheet(s)? Do the storm water management plan sheets depict the following:					
(a) Storm water management features to be constructed at the time of: ___ Initial construction ___ During phased development ___ After landfill closure					
(b) Location of sediment basins					
(c) Drainage ditches					
(d) Auxiliary sediment traps					
(e) Extent of cleared ground and stockpiles during each major phase of construction					
(f) List of anticipated actions and materials needed for sediment and erosion control					
(7) Do plans include a final waste grades plan sheet including daily and intermediate cover?					
Do plans include a final topography plan sheet? Does the final topography plan sheet show the appearance of the entire facility following closure including:					
(a) Storm water drainage features					
(b) Location of gas extraction wells					
(c) All other penetrations of the final cover					
(8) Do plan sheets include a monitoring plan sheet? Does the monitoring plan sheet show the following:					

Facility Name: \_\_\_\_\_

PLAN OF OPERATION REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(a) Location of design management zone as determined under s. NR 140.22 (b) All the devices for monitoring of: <input type="checkbox"/> Leachate quality and quantity <input type="checkbox"/> Unsaturated zone water quality and flow rate <input type="checkbox"/> Groundwater quality <input type="checkbox"/> Storm water quality <input type="checkbox"/> Gas production <input type="checkbox"/> Gas migration <input type="checkbox"/> Gas condensate <input type="checkbox"/> Surface settlement					
(9) Do plan sheets include a long-term care plan sheet? Does the long-term care plan sheet show the following:					
(a) Topography of the landfill following closure (b) Proposed schedule for monitoring and maintenance					
(10) Do plans include a minimum of 2 cross-sections both parallel and perpendicular to the facility baseline through the major dimensions of the landfill?					
(a) All combined engineering and geological cross-sections must include: <input type="checkbox"/> A reduced scale plan view on each sheet <input type="checkbox"/> Existing grades <input type="checkbox"/> Sub-base, base, top of the leachate collection blanket grades and final grades <input type="checkbox"/> Soil borings and monitoring wells the section passes through or is adjacent to <input type="checkbox"/> Soil & bedrock types <input type="checkbox"/> Stabilized water table contours <input type="checkbox"/> Leachate collection and monitoring systems <input type="checkbox"/> Gas venting or extraction and monitoring systems <input type="checkbox"/> Limits of refuse filling <input type="checkbox"/> Erosion, storm water and sediment control structures <input type="checkbox"/> Access roads and ramps on the perimeter of disposal area and within active fill area <input type="checkbox"/> The filling sequence or phasing interfaces and other facility features					
(b) Are cross-sections included which illustrate all important construction features of the following: <input type="checkbox"/> Liner <input type="checkbox"/> Final cover <input type="checkbox"/> Lysimeters <input type="checkbox"/> Leachate collection trenches and sumps <input type="checkbox"/> Liner penetrations <input type="checkbox"/> Sideslope risers <input type="checkbox"/> Piping systems for gas and gas condensate lines <input type="checkbox"/> Storm water drainage systems					
(c) Are detailed plan views included for piping outside the limits of filling for leachate header and drain lines, gas and condensate lines, and leachate forcemains?					

Facility Name: \_\_\_\_\_

PLAN OF OPERATION REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(d) Does the plan view contain notations for pipe slopes and intersection elevations with manholes, lift stations, collection tanks and gas blower stations?					
(11) Do plans include drawings showing details and typical sections? Do drawings include details for the following:					
(a) Storm water control structures					
(b) Access roads					
(c) Fencing					
(d) Final cover and base liner systems					
(e) Leachate and gas control systems such as: ___ Pipe bedding ___ Manholes ___ Transfer lines ___ Forcemains and storage tanks ___ Leachate transfer lines which extend through the liner ___ Groundwater and unsaturated zone monitoring devices ___ Buildings					
(g) Leachate and refuse containment berms between subsequent phases of development					
<b>NR 514.06 Operations manual and design report</b>					
(1) Does the operations manual and design report contain a Table of Contents?					
(2) Does the operations manual and design report contain General Information? Does the General Information identify the following:					
(a) Name of the landfill					
(b) Registered professional engineer who prepared the plans					
(c) Landfill owner, licensee and operator					
(d) Location by quarter-quarter section					
(e) Proposed limits of filling					
(f) Anticipated life and closure date					
(g) Disposal capacity					
(h) Waste tonnage and corresponding volume					
(i) Percent municipal vs. industrial waste					
(j) Anticipated geographic service area					
(k) Anticipated industrial waste type					
(l) Waste types and quantities to be disposed					
(m) Any exemptions requested from the Department					
(n) A list of conditions of facility development as stated in the feasibility determination and measures incorporated to in the plan of operation to address those conditions					

Facility Name: \_\_\_\_\_

PLAN OF OPERATION REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(3) Does the operations manual and design report include a Design Rationale? Does the Design Rationale discuss proposed designs not explicitly required by state or federal rules or conditions of feasibility determination for design of engineering features including the following:					
(a) Base grade configuration and relationship to subsurface conditions					
(b) Liner design					
(c) Phases of landfill development and closure					
(d) Traffic routing					
(e) Storm water management					
(f) Erosion and sediment control measures					
(g) Gas extraction and treatment systems					
(h) Final cover systems					
(i) Monitoring systems					
(j) Sidewall penetrations					
(k) Sideslope risers and sump area volumes and construction					
(l) Piping located outside of the limits of construction					
(4) Does the operations manual and design report address Initial Construction? Does the Initial Construction discuss initial preparation and construction relating to:					
(a) Clearing and grubbing					
(b) Topsoil stripping and other excavations					
(c) Soil storage and visual screening					
(d) Storm water control features					
(e) Base liner and granular drainage layers					
(f) Leachate collection and gas venting systems					
(g) Access roads and entrance area screening and fencing					
(h) Environmental monitoring device installation					
(i) Other special design features					
(j) A proposed schedule of: ___ Field measurements ___ Photographs to be taken ___ Sampling and testing to verify infield conditions reported in the feasibility report					
(5) Does the operations manual and design report address Storm Water Management? Does the Storm Water Management section include the following:					
(a) Description of storm waster management ___ At the time of initial construction ___ During phased development ___ After landfill closure					
(b) Narrative demonstrating compliance with s. NR 504.09					
(c) Temporary and permanent erosion and sediment control to meet s. NR 504.09(1)(b)					

Facility Name: \_\_\_\_\_

PLAN OF OPERATION REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(d) Specifications for design of: <input type="checkbox"/> Sediment basins <input type="checkbox"/> Culverts <input type="checkbox"/> Drainage ditches <input type="checkbox"/> Auxiliary sediment traps <input type="checkbox"/> Anticipated extent of cleared ground and stockpile during each major phase					
(e) A list of anticipated actions and materials needed for sediment and erosion control					
(f) A maintenance and follow-up program designed to meet s. NR 504.09(1)(b)					
(g) Schedule for the following activities: <input type="checkbox"/> Cleaning sediment basins and ditches <input type="checkbox"/> Seeding and stabilization of stockpiles and drainage channels <input type="checkbox"/> Topsoiling, seeding and stabilization of disturbed areas and areas of erosion					
(6) Does the operations manual and design report address Soil Requirements? Does the Soil Requirements section include the following:					
(a) A proposed testing schedule to document the placement of all general soil fill and backfill, base liner, final cover layers, venting and drainage layers					
(b) An explicit statement, description and justification of test methods if construction and documentation are proposed to be performed other than in accordance with ch. NR 516					
(c) A specification of the proposed soil gradations and the proposed size of perforations in the leachate collection piping and final cover drainage layer					
(d) An analysis of the pipe and soil materials to demonstrate whether the gradation of sand and gravel and pipe opening sizes are stable and self-filtering					
(e) A description of the use of filter layers or other mechanisms used to maintain the porosity in the leachate collection blanket, collection trenches and sumps					
(f) Documentation per s. NR 504.075 for any soil borrow source not included in feasibility report					
(7) Does the operations manual and design report address Monitoring? Does the Monitoring section include the following:					
(a) A proposed monitoring program developed in accordance with NR 507 and the feasibility approval for: <input type="checkbox"/> Groundwater <input type="checkbox"/> Surface water <input type="checkbox"/> Volumes and quality of gas and gas condensate <input type="checkbox"/> Unsaturated zone <input type="checkbox"/> Leachate volume and quality <input type="checkbox"/> Surface settlement					

Facility Name: \_\_\_\_\_

PLAN OF OPERATION REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(b) A table identifying: ___ Frequencies of sampling ___ Parameters to be analyzed ___ A schedule of anticipated installation and abandonment of sampling points ___ Existing and proposed sampling points and devices ___ Anticipated periods of monitoring before landfill development, during a major phase of development, and during the long-term care period					
(c) Does the report include a listing of all groundwater elevation data collected from all groundwater sampling points subsequent to preparation of the plan of op. report?					
(8) Does the operations manual and design report describe Daily Operations? Does the Daily Operations section contain the following:					
(a) The timetable for the construction of each phase of liner and final cover					
(b) Waste type accepted or excluded					
(c) Typical waste handling techniques and methods of handling unusual waste types					
(d) Hours of operation					
(e) Traffic routing					
(f) Storm water management					
(g) Sediment and erosion control					
(h) Windy, wet and cold weather disposal operations					
(i) Fire protection equipment					
(j) Anticipated staffing requirements					
(k) Methods for vector, dust and odor control					
(l) Daily cleanup					
(m) Leachate removal during hours of operation as well as nights, weekends and holidays					
(n) Direction of filling					
(o) Salvaging					
(p) Record keeping					
(q) Parking for visitors, users and employees					
(r) A description of limitations or operational practices necessary due to the presence of other open or closed landfills, demolition landfills, processing facilities, storage facilities, composting facilities and other solid waste facilities on the same property?					
(9) Does the operations manual and design report describe Phased Development? Does the Phased Development section describe the following:					
(a) Landfill operations and development of subsequent phases					
(b) A definition of the critical stage of disposal relative to start of construction in subsequent phases					

Facility Name: \_\_\_\_\_

PLAN OF OPERATION REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(c) The anticipated construction in each phase for storm water management, monitoring, abandonment of fill areas and installation and maintenance of gas and leachate control structures					
(10) Does the operations manual and design report describe Phased Closure? Does the Phased Closure section describe?					
(a) The actions taken when landfill phases reach waste final grades closure of phases at waste final grades					
(b) Anticipated sequence of required events for landfill closure					
(c) Actions necessary to prepare the landfill for long-term care and final use					
(11) Does the operations manual and design report include a Long-Term Care schedule?					
(a) Does the Long-Term Care schedule describe procedures for inspection and maintenance of: ___ Cover vegetation ___ Storm water control structures ___ Refuse or ground surface settlement or siltation ___ Erosion damage ___ Gas and leachate control features ___ Gas, leachate and groundwater monitoring ___ Other long-term care needs ___ Final use plan for the landfill					
(12) Does the operations manual and design report include the following written agreements:					
(a) A draft leachate treatment agreement					
(b) A signed clay procurement agreement or option for acquisition of borrow property for volumes necessary to construct and close the first major phase of the landfill					
(c) Any miscellaneous agreements such as easements					
(13) Does the operations manual and design report include specifications for construction operation and closure of the landfill? Do the specifications include the following:					
(a) Detailed instructions to operator and contractor for all aspects of construction & operation					
(b) References to specifications on the plan sheets such as: ___ Geosynthetic material installation instructions ___ Tank manufacturer installation instructions ___ Pump performance criteria ___ Materials and construction methods for sideslope risers, sidewall penetrations, sump areas, and all piping located outside the limits of filling					
(14) Does the operations manual and design report include Design Calculations? Do the Design Calculations include the following:					
(a) Information on financial responsibility for closure and long-term care of the landfill					

Facility Name: \_\_\_\_\_

PLAN OF OPERATION REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(b) Discussion of all calculations such as: <input type="checkbox"/> Refuse to cover balance computations <input type="checkbox"/> Base liner and final cover soil needs relative to available borrow soil volumes <input type="checkbox"/> Stockpile estimates <input type="checkbox"/> Required shear strength for upper and lower interfaces for all geosynthetic materials and soils <input type="checkbox"/> Storm water management systems <input type="checkbox"/> Infiltration and leachate collection and leakage volumes					
(c) A summary of the calculations with detailed equations appended to the report?					
(d) References to the plan sheets from which variables for the calculations are obtained					
(14m) Does the operations manual and design report include assessment of shear strength and slope stability of soils and waste in following scenarios					
(a) Interim and final waste slopes incorporating: <input type="checkbox"/> In-field waste densities <input type="checkbox"/> Settlement <input type="checkbox"/> Leachate recirculation <input type="checkbox"/> Precipitation <input type="checkbox"/> Other factors that affect strength of waste or final cover <input type="checkbox"/> Analyses of interior slopes between filling phases <input type="checkbox"/> Analyses of exterior slopes at waste final grades					
(b) Haul roads and access ramps: <input type="checkbox"/> On interim slopes <input type="checkbox"/> On waste final grades <input type="checkbox"/> On final cover <input type="checkbox"/> Passive load of cover soils <input type="checkbox"/> Dynamic loads due to construction, hauling and maintenance vehicles					
(15) Does the operations manual and design report include Financial Responsibility Analysis? Does the Financial Responsibility Analysis include the following:					
(a) Costs associated with the closure of the landfill					
(b) Costs associated with performing each year of long-term care					
(c) All assumptions used, including the sources and rationale for the selected cost factors					
(d) Anticipated operating life and replacement schedules of engineering features reflected in the cost estimates					
(e) Proposed methods of establishing proof of financial responsibility for closure and long-term care					
(16) Does the operations manual and design report include an Appendix? Does the Appendix include the following;					
(a) A list of references used					
(b) Additional data not previously presented					
(c) Supplemental design calculations					

PLAN OF OPERATION REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(d) Material specifications					
(e) Operating agreements such as leachate treatment and soil borrow					
(f) Documents relating to long-term funding					
(g) Documents relating to notification on deed of properties with wells within 1200-ft setback					
(h) Other appropriate information					
<b>NR 514.07 Miscellaneous requirements for plans of operation</b>					
<b>(1) GEOSYNTHETICS REQUIREMENTS</b>					
Does the landfill design include a composite liner, composite cap or utilize geomembrane for liner or a geomembrane or geomembrane-GCL for capping layer? If so, are the following design details and specifications for the geosynthetic components included:					
(a) A description of the geomembrane, GCL, and other geosynthetics including resins and additives, physical properties, bentonite characteristics, chemical resistance properties, and potential suppliers. For GCLs the geotextile properties and reinforcement					
(b) Design calculations that demonstrate the stability of the landfill and its components against failure along potential failure surfaces, such as the leachate collection system and final cover, during operations as well as after closure					
Have potential failure surfaces such as the interfaces both below and above the geomembrane in the liner and final cover been considered?					
Have potential failure scenarios been considered which include both saturated and unsaturated conditions?					
(c) Construction methods and supervisory controls for preparing the surface of the topmost lift of compacted clay prior to geomembrane installation or soil barrier layer prior to GCL installation and inspection methods and removal of coarse gravel or cobbles after rolling the clay or soil barrier layer					
(d) A description of measures to be taken to store and protect geomembrane, GCL and geocomposite drains transport geomembrane, GCL and geocomposite drain panels from storage to the working area and construction methods to place geomembrane, GCL and geocomposite drain panels					
(e) The proposed orientation of all geomembrane and GCL panels for the liner and cap in relation to slope, collection trenches, penetrations, anchor trenches and phase boundaries, seaming methods, and phased construction					
(f) Typical design details of geomembrane and GCL seams and seaming methods, anchor trenches, patches, collars for all penetrations, and installation in corners and leachate collection trenches					
A description of acceptable working conditions for geomembrane, GCL and geocomposite drain installation, installation instructions for working under weather variations and extremes, and criteria for halting or limiting geomembrane and GCL installation					

PLAN OF OPERATION REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(g) Proposed methods for testing welds or other geomembrane joining methods for geomembranes and other components or penetrations if geomembranes used in previously constructed phases are obtained from different manufacturers or are made from different resins.					
Measures to preserve geomembrane and GCL edges for future welding					
Describe measures to repair all geomembrane, GCL and geocomposite drain defects, unacceptable wrinkles and seams					
(h) Construction methods for placing: ___ Leachate collection system, sump backfill, and sideslope riser over the composite liner ___ First 10 feet of waste over the leachate collection system ___ Subsurface drain layer and rooting zone soils over the composite cap ___ Measures to assure that geomembrane and GCL are not damaged by construction of soils, placement or compaction of waste, or waste consolidation or mass movement or puncturing.					
(i) Is a Construction Quality Control plan to be followed by all contractors included?					
Does the CQC plan include means for determining and documenting the following: ___ Receipt of the proper geomembrane, GCL and geocomposite drain material ___ Acceptable subgrade and weather conditions for work to occur ___ Seamer qualifications and procedures for trial seams ___ Acceptability of test welds and machine settings ___ Acceptable seaming practices ___ Achieved seam quality and procedures for dealing with failing tests ___ Patching ___ Sealing of geomembrane penetrations ___ A description of how progress in construction and variations from the approved plans will be recorded and reported					
(j) Is a Construction Quality Assurance plan to be followed by the registered professional engineer and qualified technician performing the documentation included?					
Does the CQA plan include the following: ___ Continuous observation of all aspects of geomembrane, GCL and geocomposite drain installation ___ Use of non-destructive and destructive testing of seams and samples ___ Proposed schedule of tests and frequencies per ch. NR 516 ___ Proposed methods of verifying the acceptability of subgrade, repairs, patches, seams, penetrations and adaptations to unforeseen conditions					
(k) Is an outline of the contents of the preconstruction submittal included which complies with s. NR 516.04(5)?					

PLAN OF OPERATION REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(L) Does the construction quality assurance plan for conducting leak location survey include: ___ Conduct survey after placing the leachate collection layer ___ Continuous observation of the leak location survey by QA ___ Nondestructive methods to detect, locate and verify repairs of defects in geomembrane ___ Electrical resistivity test or other test method acceptable to the Department					
(2) CODISPOSAL OF INDUSTRIAL SOLID WASTES.					
(a) If the landfill accepts municipal waste, are measures described which will be taken for the disposal of waste from the following: ___ Industrial sources ___ Clean up of spills and contaminated sites ___ Other commercial sources					
(b) Does the plan of operation propose the following: ___ List of waste categories ___ Testing protocols and schedules ___ Disposal protocols					
(c) Is there a description of the format for transmitting summary information to the Department					
(3) CLOSURE OF LANDFILLS WITH COMPOSITE LINERS AND COMPOSITE CAPS.					
Does the plan of operation for municipal solid waste landfill propose delaying final cover placement? If yes, does plan of operation provide for the following requirements:					
(a) Intermediate cover consisting of a minimum one foot of soil placed and seeded over waste at final grades.					
(b) No additional waste placement in areas at final grades which have received intermediate cover					
(c) Installation and operation of active gas extraction system following attainment of final grades within each phase of landfill designed with an active system					
(d) Installation of blower, flare, driplegs, controls, condensate handling, and appurtenances of the gas extraction system prior to or as part of attainment of final grades in the first phase					
(4) CLOSURE OF PAPERMILL SLUDGE LANDFILLS.					
(a) If the landfill is proposed as a pulp and paper mill sludge or other low strength waste landfill, does the plan of operation propose a delay in the placing of final cover which is limited to 2 years?					
(b) Does the plan of operation justify delay in placement of final cover?					
(5) MUNICIPAL SOLID WASTE COMBUSTOR RESIDUE MANAGEMENT PLANS.					
If municipal solid waste combustor residue is proposed to be accepted, does the plan of operation include a combustor residue management plan?					

Facility Name: \_\_\_\_\_

PLAN OF OPERATION REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
If municipal solid waste combustor residue is proposed to be accepted, does the facility have approved plans which substantially meets NR 514.04 to 514.08?					
(a) Does residue management plan contain: <input type="checkbox"/> The name and location of the proposed sources <input type="checkbox"/> Expected volume from each source of municipal solid waste combustor residue to be accepted?					
(b) Does the residue management plan establish: <input type="checkbox"/> A timetable for evaluating the results of the testing requirements of NR 502.13(8) <input type="checkbox"/> Trends in results from previous testing to determine changes to the proposed landfill design and operation					
(c) Does the residue management plan include plan sheets which include the following: <input type="checkbox"/> Design requirements of s. NR 504.11 <input type="checkbox"/> Plan views <input type="checkbox"/> Cross-sections <input type="checkbox"/> Details necessary to illustrate the applicable design features of the landfill <input type="checkbox"/> Phasing plan sheets to show development of the landfill portion through time					
(d) Does residue management plan include an operations manual and design report which addresses the following: <input type="checkbox"/> Daily operations for the landfill portion utilized for disposal of combustor residue <input type="checkbox"/> Discussion of time table for phased development <input type="checkbox"/> Waste types accepted or excluded <input type="checkbox"/> Typical waste handling techniques and methods for handling unusual waste types <input type="checkbox"/> Hours of operation <input type="checkbox"/> Traffic routing <input type="checkbox"/> Drainage and erosion control <input type="checkbox"/> Windy, wet and cold weather operations <input type="checkbox"/> Methods of dust control <input type="checkbox"/> Direction of filling <input type="checkbox"/> Methods to maintain compliance with s. NR 506.15					
(e) Does the residue management plan propose modifications to the groundwater, unsaturated zone, and leachate monitoring program necessary to comply with the requirements of NR 507?					
(6) OTHER REQUIREMENTS. Does the plan of operation provide the following details and specifications, where applicable?					
(a) Description of alternative cover materials to be used for daily or intermediate cover					

PLAN OF OPERATION REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(b) If the design includes a geomembrane component of lysimeters and sumps for sideslope risers, the following must be included: ___ Description of 24 hour leak detection test for the geomembrane component of lysimeter and sidewall riser sumps ___ Description of a proposal for an alternate leak detection test such as electrical resistivity testing					
(c) Does the design for the sideslope riser and sump pump indicate: ___ Strength of resin, diameter and wall thickness of the sideslope riser with regard to maximum overburden weight over sump at field capacity ___ Description of physical and hydraulic specification of pump ___ Pump able to traverse any bend or elbow in the riser pipe for placement and removal ___ Pump selection based on highest leachate flow rate including leachate recirculation					
Does the cross-section of the sideslope riser include: ___ Pipe bends ___ Pump with wheels ___ Pump connectors, hoses, and electrical leads ___ Head level controls					
(d) Has the applicant provided preventive action limit (PAL) calculations for inorganic detection monitoring parameters in accordance with s. NR 507.27(1), Wis. Adm. Code?					
(e) Has the applicant provided an additional four rounds of baseline monitoring results for any parameter listed in NR 507 Appendix 1, Table 3, from any well meeting the requirements of s. NR 507.18(2)(b), Wis. Adm. Code?					
(6M) DOES THE LANDFILL DESIGN INCLUDE A CONTIGUOUS EXPANSION. If no skip to (7). If yes does the plan include a list of approval conditions or orders that includes:					
(a) Chronological list of Department approvals, orders and expedited plan modifications.					
(b) A list of approval conditions or order conditions that are active and subject to compliance.					
(c) Status of each condition listed as remain active, comparable code or alternative proposed					
(d) Justification to support status for each condition					
(7) DOES THE LANDFILL PROPOSE LEACHATE RECIRCULATION? If not skip to (8). If yes does the leachate recirculation plan include the following:					

PLAN OF OPERATION REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(a) A narrative that explains design rational including: <input type="checkbox"/> Leachate loading rate <input type="checkbox"/> Distribution frequency <input type="checkbox"/> Well or pipe spacing and placement <input type="checkbox"/> Well or pipe length <input type="checkbox"/> Screened interval <input type="checkbox"/> Sealing and bedding materials <input type="checkbox"/> Anticipated flow characteristics <input type="checkbox"/> Areas where leachate will not be recirculated <input type="checkbox"/> Incorporate s. NR 504.095 requirements as appropriate					
(b) Plan sheets showing conceptual layout of leachate recirculation system and design details					
(c) Calculations for proposed loading rates for leachate recirculation for each leachate drainage basin that include: <input type="checkbox"/> Leachate volume recirculated <input type="checkbox"/> Precipitation <input type="checkbox"/> Field capacity of the waste <input type="checkbox"/> Absorptive capacity of the waste <input type="checkbox"/> Waste filling rates <input type="checkbox"/> Separation distance and elevation of distribution piping and wells <input type="checkbox"/> Loss of water by waste decomposition and water vapor in gas					
(d) Calculation of effects on flow rate in leachate collection system and maximum leachate head on liner of less than 12-inches					
(e) Daily operational plan that addresses <input type="checkbox"/> Prevention of leachate seeps and build-up <input type="checkbox"/> Prevention of odors <input type="checkbox"/> Actions if nuisance conditions occur <input type="checkbox"/> Management of enhanced methane production <input type="checkbox"/> Care and maintenance of tanks, pumps and distribution systems					
(f) Identification of warning symptoms and failure thresholds including: <input type="checkbox"/> Elevated leachate heads <input type="checkbox"/> Significant and persistent odors <input type="checkbox"/> Excessively acidic leachate <input type="checkbox"/> Other data indicating poor waste decomposition conditions <input type="checkbox"/> Seeps <input type="checkbox"/> Excessive pressures within the waste mass <input type="checkbox"/> Saturated conditions <input type="checkbox"/> Reduced shear strength of the waste mass <input type="checkbox"/> Other warning symptom conditions					

PLAN OF OPERATION REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(g) Monitoring plan that tracks: <input type="checkbox"/> Leachate volume extracted for each drainage basin <input type="checkbox"/> Leachate volume recirculated for each drainage basin <input type="checkbox"/> Precipitation volume for each drainage basin <input type="checkbox"/> Leachate heads <input type="checkbox"/> Gas volumes <input type="checkbox"/> Leachate characteristics <input type="checkbox"/> Other appropriate requirements of s. NR 507.215					
(h) Specify documentation and record-keeping of: <input type="checkbox"/> construction <input type="checkbox"/> operation <input type="checkbox"/> monitoring  Specify information to be sent to Department and frequency of submittals					
(i) Diagram and narrative of devices used to extract gas produced by leachate recirculation including: <input type="checkbox"/> Gas extraction equipment <input type="checkbox"/> Fittings <input type="checkbox"/> Devices  Schedule of operation of gas extraction system in cells with leachate recirculation					
(j) Description of circumstances under which leachate recirculation would be halted					
(8) DOES THE LANDFILL PROPOSE LEACHATE COLLECTION LINES THAT EXCEED 1,200 FEET? If no skip to (9). :					
(a) If yes does the plan include the following:					
(b) Calculations that assess landfill foundation for stability and settlement  Parameters determined from samples taken from borings in subgrade below the proposed fill area					
(c) Design rationale for leachate collection system layout and alignment including:					
1. Discussion of pipe strength calculation that consider: <input type="checkbox"/> Design overburden weight <input type="checkbox"/> Pipe materials <input type="checkbox"/> Wet unit weights <input type="checkbox"/> Densified waste after consolidation and decomposition <input type="checkbox"/> Potential use of leachate recirculation					
2. Demonstration that the design minimizes changes in alignment of leachate collection trenches and pipes					
3. Hydraulic capacity analysis that demonstrate ability of leachate collection system to contain design flows within the collection trench and sump system that includes:					

PLAN OF OPERATION REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
a. Design specifications for: <input type="checkbox"/> Leachate collection blanket <input type="checkbox"/> Leachate collection trench dimensions <input type="checkbox"/> Leachate collection trench backfill <input type="checkbox"/> Slope of landfill base and sideslopes <input type="checkbox"/> Slopes of pipe and trenches <input type="checkbox"/> Liner area draining to each sump					
b. Active filling life assessment based on precipitation rate of two inches per month with and without leachate recirculation					
c. Post-closure assessment based on hydraulic conductivities of 10% or less of design hydraulic conductivities for the leachate collection blanket and trench backfill and an annual leachate collection rate of one inch per year					
d. Sump dimensions and pump specifications to confine leachate accumulation in the sumps and intersecting leachate collection trenches. Examples of commercially available pumps					
(d) Calculations for maximum overburden loads calculated under s. NR 504.06(6)(e) that demonstrate the: <input type="checkbox"/> Leachate collection pipe and bedding material as placed possess structural strength to support maximum loads imposed by overlying materials and equipment <input type="checkbox"/> Leachate pipe is designed to maintain its wall integrity under expected maximum loads					
(e) Specifications and construction methods for bedding leachate collection pipes that: <input type="checkbox"/> Maximize competent support of pipes <input type="checkbox"/> Eliminate bridging <input type="checkbox"/> Maintain design slope of the pipe					
(f) Specifications for : <input type="checkbox"/> Use of sweep bends at all changes of alignment of leachate collection pipes <input type="checkbox"/> Construction methods to provide support for pipe and sweep bends <input type="checkbox"/> Measures to be taken to minimize obstructions to or friction with pipe cleaning equipment					
(g) Construction quality assurance plan for evaluating construction of the leachate collection trench and piping to ensure fabrication and installation meet design specifications that includes: <input type="checkbox"/> Continuous observation of trench and pipe construction by qualified engineer or technician <input type="checkbox"/> Observation, survey measurements and testing frequency in accordance with NR 516 <input type="checkbox"/> Methods for verifying acceptability of trench and pipe alignment, materials, and sweep bends <input type="checkbox"/> Adaptation by owner and contractors to unforeseen conditions					

PLAN OF OPERATION REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(h) Description of equipment and methods capable of inserting cleanout devices through all leachate collection pipes from each access point to the toe of the opposite sideslope					
(i) Procedures for soil borings and laboratory consolidation testing to verify settlement analyses.					
<b>(9) Organic Stability Plan</b>					
(a) Does the plan of operation contain a plan to significantly reduce the amount of degradable organic material remaining after site closing?					
(b) Does the organic stability plan include: ___ Overview of the plan ___ Composition and quantity of material accepted by landfill, include classification of organic materials and percentage of organically inert material and description of how analysis performed ___ Description of measures to be taken that will significantly reduce amount of degradable organic material remaining after site closure and shorten time to achieve landfill organic stability ___ Schedule for implementing the plan ___ Outcome of plan relative to goals in (c) and definition of landfill organic stability in NR 500.03(120g) ___ Methods used to monitor and evaluate the progress of facility in implementing the plan and measurements or milestones used in evaluating progress toward goals ___ Contingency plan with measure to be taken if evaluation indicates landfill is unlikely to achieve goals					
(c) Does the organic stability plan include achievement of the following measureable goals 40 years or less after site closure: ___ Monthly average total methane plus carbon dioxide gas production rate less than or equal to 5% of maximum monthly average total gas production rate during the life of the facility or less than 7.5 cubic feet of total gas per year per cubic yard of waste ___ Steady downward trend in rate of total methane plus carbon dioxide gas production ___ Production of total methane plus carbon dioxide gas cumulatively representing 75% or greater of the projected total gas production of the landfilled waste ___ Reduction of time to reach organic stability to 40 years or less after site closure					
(d) Does the organic stability plan include continual evaluation of the plan with annual reports to the Department that include ___ Changes needed to the plan to correct problems ___ Changes needed to the plan to improve results ___ Updates to the contingency plan if appropriate					

Facility Name: \_\_\_\_\_

PLAN OF OPERATION REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(e) Does the organic stability plan include an examination of progress against the approved plan every 5 years to evaluate and determine if the facility will reach the goals in (c) and weather the contingency plan will be implemented?					

Legal Note:

This document is intended solely as guidance, and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. This guidance does not establish or affect legal rights or obligations and is not finally determinative of any of the issues addressed. This guidance does not create any rights enforceable by any party in litigation with the State of Wisconsin or the Department of Natural Resources. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.