

Licence No.: 2482 R

Licence Issued: October 2, 2000

Licence Revised: January 15, 2001

**IN ACCORDANCE WITH THE MANITOBA ENVIRONMENT ACT (C.C.S.M. c. E125)
THIS LICENCE IS ISSUED PURSUANT TO SECTION 11(1) TO:**

THE RURAL MUNICIPALITY OF RITCHOT "the Licencee"

for the construction and operation of the Development being a Class 1 Waste Disposal Ground in the Rural Municipality of Ritchot located on subdivision 4 of Section 32 - Township 8 - Range 4EPM, relative to:

- the Proposal filed under The Environment Act on January 22, 1999;
- the Environmental Impact Assessment dated March 2, 2000;
- the Revised Phase I - Site Characterization report dated March 2, 2000;
- Phase II - Conceptual Design/Construction, Performance Monitoring and Closure report dated March 3, 2000;
- the Detailed Design - Construction, Operation and Closure report dated July 21, 2000;
- the R.M. of Ritchot W.D.G. plans dated August, 2000;
- the Special Provisions report dated August 17, 2000;
- the Addendum to Detail Design letter dated September 12, 2000; and

subject to the following specifications, limits, terms and conditions:

DEFINITIONS

In this Licence,

"access road" means a road that leads from a Provincial Trunk Highway, Provincial Road, or a municipal road;

"accredited laboratory" means an analytical facility accredited by the Standard Council of Canada (SCC), or accredited by another accrediting agency recognized by Manitoba Conservation to be equivalent to the SCC, or able to demonstrate, upon request, that it has the quality assurance/quality control (QA/QC) procedures in place equivalent to accreditation based on the Canadian Standard Can/CSA-Z753, extension of the international standard ISO 9000, Guide 25;

"active area" means a designated trench or berm confined area of a waste disposal ground in which solid wastes are deposited;

"affected area" means a geographical area, excluding the property of the Development;

"approved" means approved in writing;

"authorized personnel" means persons, companies or firms authorized by the Licencee to have access to the waste disposal ground;

"background water quality" means the quality of water in any geologic zone monitored with regards to the chemical and microbiological parameters specified in a Licence issued pursuant to The Environment Act by the Director;

"body of water" means any body of flowing or standing water whether natural or artificially created;

"bulky metallic waste" means, but is not limited to, derelict vehicles, farm machinery, and large appliances which are capable of being salvaged for recycling or reuse;

"cell" means a deposit of waste that has been covered by cover material so that no waste deposited in the cell is directly exposed to the atmosphere;

"Class 1 Waste Disposal Ground" means a waste disposal ground serving a population in excess of 5,000 persons;

"closure plan" means a plan indicating the actions to be taken for the closure of the Development;

"compliance boundary" means the planar surface that circumscribes the Development, extends vertically downward from the land surface, and constitutes the place at which the parameters of the background water quality as specified in a Licence issued pursuant to The Environment Act by the Director, are not to be exceeded;

"concentration value" means a restriction established by a Licence issued pursuant to The Environment Act by the Director on quantities, discharge rates and concentrations of pollutants;

"contaminant", in relation to the site, means any product, substance or organism that is foreign to or in excess of the natural constituents of the environment at the site and that:

- a. has affected, is effecting or may affect the natural, physical, chemical or biological quality of the environment,
or
- b. is, or is likely to be, injurious or damaging to the health or safety of a person;

"cover material" means material which is free of roots, vegetation and frozen material, or other material as approved by the Director, that is used to cover compacted solid waste;

"Director" means an employee so designated pursuant to The Environment Act;

"dwelling" means a building or part of a building that is used for living or business purposes and includes a mobile home;

"Environment Officer" means an employee so designated pursuant to the Environment Act;

"groundwater" means water below the surface of the ground and within a zone of saturation;

"hazardous waste" means any substance or group of substances that meets the criteria of a hazardous waste as determined by Manitoba Regulation 282/87, as amended from time to time;

"leachate" means liquid that has percolated through solid waste, and that contains dissolved and suspended materials from such matter;

"liner" means a continuous layer of reworked soil, or man-made materials beneath and on the sides of a land disposal facility, compost facility, or storage area and that restricts the downward or lateral escape of solid waste, leachate and gas;

"liquid industrial waste" means waste generated by industrial processes that has a slump of more than 150 mm using the slump test method (slump test, C.S.A. Standards Test Method A 23.1-5C), and does not include hazardous waste or industrial waste;

"liquid waste" means sewage, sewage effluent and sludge from septic tanks, holding tanks and municipal sewage treatment systems and that has a slump of more than 150 mm using the slump test method (slump test, C.S.A. Standard Test Method A 23.2-5C);

"monitoring point" means any installation or location used to determine the quality or physical characteristics of groundwater, surface water, or water in the unsaturated zone;

"notify" means notify in writing;

"noise nuisance" means a continuous or repeated noise in an affected area, which is offensive, obnoxious, troublesome, annoying, unpleasant, or disagreeable to a person;

- a. residing in an affected area;
- b. working in an affected area; or
- c. present at a location in an affected area which is normally open to the members of the public;

if the noise

- d. is the subject of at least 5 written complaints, received by the Director in a form satisfactory to the Director and within a 90-day period, from 5 different persons falling within clauses a), b) or c), who do not live in the same household; or
- e. is the subject of at least one written complaint, received by the Director in a form satisfactory to the Director, from a person falling within clauses a), b) or c), and the Director is of the opinion that if the noise had occurred in a more densely populated area there would have been at least 5 written complaints received within a 90-day period, from 5 different persons who do not live in the same household;

"odour nuisance" means a continuous or repeated odour, smell or aroma, in an affected area which is offensive, obnoxious, troublesome, annoying, unpleasant or disagreeable to a person:

- a. residing in the affected area;
- b. working in the affected area;
- c. present at a location in the affected area which is normally open to members of the public;

if the odour, smell or aroma

- d. is the subject of at least 5 written complaints received by the Director in a form satisfactory to the Director, and within a 90 day period, from 5 different persons falling within clauses a), b), or c), who do not live in the same household; or
- e. is the subject of at least one written complaint, received by the Director in a form satisfactory to the Director, from a person falling within clauses a), b), or c), and the Director is of the opinion that if the odour, smell or aroma had occurred in a more densely populated area there would have been at least 5 written complaints received within a 90 day period from 5 different persons who do not live in the same household;

"post-closure plan" means a plan indicating the actions to be taken for the care, maintenance, and monitoring of the Development after closure, that will prevent, mitigate, or minimize the threat to public health and the environment;

"radioactivity" means the spontaneous decay or disintegration of an unstable atomic nucleus, accompanied by the emission of radiation;

"site" means the area both permanent and temporary which is required for the construction and operation of the Development;

"Standard Methods for the Examination of Water and Wastewater" means the most recent edition of Standard Methods for the Examination of Water and Wastewater published jointly by the American Public Health Association, the American Waterworks Association and the Water Environment Federation;

"top soil" means soil that is free of roots, vegetation, weeds and stones larger than 50 mm, and capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding;

"water storage area" means an area constructed in a manner approved by the Director to retain storm water runoff, for a limited time, for the purpose of chemical and bacterial analysis prior to disposal in a manner approved by the Director; and

"water table" means the upper surface of the zone of saturation at which point the fluid pressure is equal to the atmosphere.

GENERAL TERMS AND CONDITIONS

This Section of the Licence contains terms and conditions intended to provide guidance to the Licencee in implementing practices to ensure that the environment is maintained in such a manner as to sustain a high quality of life, including social and economic development, recreation and leisure for present and future Manitobans.

1. The Licencee shall ensure that surface drainage from the access roads to the Development is constructed to divert clean surface water (surface runoff) from the site and leads to the adjoining access road drainage system.
2. The Licencee shall ensure that permanent and temporary dyke structures and surface drainage shall be constructed to divert surface runoff from active waste disposal cells under construction to the water storage area.
3. The Licencee shall ensure that an internal drain system is constructed to divert non-contaminated runoff from the Development to the water storage area.
4. The Licencee shall ensure that no diversion of surface drainage other than that specified in Clauses 2 and 3 of this Licence, is constructed which would generate more drainage flow than presently exists in the area of the site.
5. The Licencee shall undertake, for a period of time deemed appropriate by the Director, the sampling and analysis of water stored in the water storage area, prior to discharge, for the following parameters and shall submit the results of all such analyses to the Director:
 - a. alkalinity (bicarbonate, carbonate and hydroxide);
 - b. benzene;
 - c. calcium;
 - d. chloride;
 - e. conductivity;
 - f. copper;
 - g. ethylbenzene;
 - h. fluoride;
 - i. hardness;
 - j. iron;
 - k. manganese;
 - l. magnesium;
 - m. nitrate-nitrite-nitrogen;
 - n. pH;
 - o. potassium (dissolved);
 - p. sodium;
 - q. sulphate (dissolved);
 - r. toluene;
 - s. total coliform and E.Coli;
 - t. xylene; and
 - u. zinc.
6. The Licencee shall receive approval from an Environment Officer prior to discharge of water stored in the water storage area.
7. The Licencee shall submit all information required to be provided to the Director under this Licence, in writing, in such form (including number of copies), and of such content as may be required by the Director.
8. The Licencee shall notify the Director of, and receive approval from the Director, for any alteration to the Development as Licenced, prior to proceeding with the alteration.

SPECIFICATIONS, LIMITS, TERMS AND CONDITIONS

General

9. In addition to any of the following specifications, limits, terms and conditions specified in this Licence, the Licencee shall, upon the request of the Director:
 - a. sample, monitor, analyze or investigate specific areas of concern regarding any seepage and discharge rates and for such duration and frequencies as may be specified;
 - b. determine the environmental impact associated with the release of any pollutant from the Development; or
 - c. provide the Director within such time as may be specified, with such reports, drawings, specifications, analytical data, flow rate measurements corrective actions and such other information as may from time to time be requested.
10. The Licencee shall, unless otherwise specified in this Licence:
 - a. carry out all preservations and analyses on liquid samples in accordance with the methods prescribed in "Standard Methods for the Examination of water and Wastewater" or in accordance with an equivalent analytical methodology approved by the Director;
 - b. ensure that all analytical determinations are undertaken by an accredited laboratory; and
 - c. report the results to the Director, in writing or in a format acceptable to the Director, within 60 days of the samples being taken.
11. The Licencee shall ensure that, during construction and operation of the Development, spills of fuels or other contaminants are reported to an Environment Officer in accordance with the requirements of *Manitoba Regulation 439/87* respecting *Environmental Accident Reporting*.
12. The Licencee shall ensure an engineer(s), registered with the Association of Professional Engineers and Geoscientists of the Province of Manitoba, is responsible for the construction of the Development in accordance with the plans, specifications and design report submitted in support of the proposal.
13. The Licencee shall not cause or permit a noise nuisance to be created as a result of the construction, operation or alteration of the Development, and shall take such steps as the Director may require to eliminate or mitigate a noise nuisance.
14. The Licencee shall not cause or permit an odour nuisance to be created as a result of the construction, operation or alteration of the Development, and shall take such steps as the Director may require to eliminate or mitigate an odour nuisance.
15. The Licencee shall deposit all waste, other than material intended for recycling, in an active area within the Development.
16. The Licencee shall ensure that at least one sign is posted along the primary access road to the disposal site indicating the location of the site and the hours of operation.
17. The Licencee shall ensure that adequate signage is posted at the entrance to the Development indicating, but not limited to the following:
 - a. the types of wastes not accepted at the site;
 - b. authorized personnel to the site;
 - c. the hours and days of operation; and
 - d. telephone numbers that should be called in the event of an emergency occurring at the site.

Construction

18. The Licencee shall, unless otherwise required by this Licence or the Director, construct the Development in

accordance with the R.M. of Ritchot W.D.G. plans dated August 2000 and the report entitled Special Provisions dated August 17, 2000, submitted in support of the Proposal.

19. The Licencee shall, prior to initiating construction, submit design plans sealed by an engineer(s) registered with the Association of Professional Engineers and Geoscientists of the Province of Manitoba for the Development to the Director for approval.
20. The Licencee shall ensure that prior to the construction of the active area, all top soil is removed to a minimum depth of 150 mm and stored at a suitable location for future use.
21. The Licencee shall ensure that areas designated for use for the construction of the active areas are graded to design lines as indicated in:
 - a. the Detailed Design report dated July 21, 2000; and
 - b. the details of the design plans dated August 2000;

submitted in support of the Proposal.

22. The Licencee shall submit to the Director for approval prior to construction, eight sets of engineering design plans in respect of the water storage area for the Development. The engineering design plans shall address construction specifications and include, but not be limited to the following:
 - a. access road(s) to the water storage area;
 - b. details of the location of the water storage area with respect to property lines;
 - c. details of the water storage area drainage system;
 - d. details of a drainage system to prevent storm water runoff to the active area; and
 - e. the inner slopes of the water storage area.
23. The Licencee shall ensure that:
 - a. the clay liner is recompacted to a minimum thickness of 1 metre for the side slopes and 0.4 metres for the base of the waste cells;
 - b. each lift in which the clay liner is recompacted on the side slopes and base is not more than 0.2 metres in compacted thickness;
 - c. the in-place recompacted hydraulic conductivity of the clay liner on the side slopes and base of the waste cells is 1×10^{-7} cm/second or lower;
 - d. during installation of the clay liner care is taken to:
 - i. control soil properties and water content;
 - ii. ensure the breakup of clods;
 - iii. control lift thickness and compaction;
 - iv. remove stones larger than 100 millimetres;
 - v. prevent desiccation of the compacted clay liner;
 - vi. prevent damage to the compacted clay liner due to freezing;
 - vii. prevent damage to the compacted clay liner from vehicular traffic; and
 - viii. prevent damage to the compacted clay liner due to differential settlement; and
 - e. a qualified geotechnical engineer confirms, in report form, that there is no evident cracking in the constructed liner, or significant occurrence of clods, stones, branches or other material that could shorten the service life of the constructed liner or significantly increase the hydraulic conductivity.

24. The Licencee shall ensure that fuel storage and equipment servicing areas established for the construction and operation of the Development are located a minimum distance of 100 metres from any waterbody, and shall comply with the requirements of *Manitoba Regulation 97/88R* respecting *Storage and Handling of Gasoline and*

Associated Products.

25. The Licencee shall ensure that the proposed landscaping and planting of trees and shrubs at the Development are completed within the first year of operation as indicated in the Detailed Design report dated July 21, 2000 submitted in support of the Proposal.

Operation

26. The Licencee shall ensure that no burning of waste occurs at the Development unless otherwise approved by the Director.
27. Unless otherwise approved by the Director, the Licencee shall ensure that the following wastes are not accepted at the Development:
 - a. liquid industrial waste;
 - b. liquid waste;
 - c. dead livestock;
 - d. soils or sediments containing contaminants at concentrations in excess of the criteria specified for industrial occupancy in the Canadian Council of Ministers of the Environment (CCME), Environmental Quality Guidelines (latest edition), and the CCME Canada Wide Standards; and
 - e. hazardous wastes.
28. The Licencee shall ensure that commercial vehicles transporting wastes to the Development access the Development by means of a transportation route(s) approved by the Director.
29. The Licencee shall ensure that commercial vehicles transporting wastes to the Development are covered to prevent the spread of litter on transportation routes and the surrounding areas.
30. The Licencee shall ensure that wastes deposited in the active areas are compacted and covered daily with cover material.
31. The Licencee shall ensure that the maximum elevation of the above ground deposit of waste including the final cover does not exceed 8 metres.
32. The Licencee shall ensure that the maximum liquid depth in the water storage area does not exceed 2.5 metres at any given time.
33. The Licencee shall ensure that adequate portable litter fences are positioned around the active area or such other locations where unloading and handling occurs.
34. The Licencee shall ensure that, prior to commencing operation of the Development, a plan for all fences and fence gates proposed for the Development is submitted to the Director for approval.
35. The Licencee shall ensure that, prior to commencing operation of the Development, all fences and gates are constructed in accordance with the plan approved by the Director.
36. The Licencee shall ensure that leachate and contaminated water collected at the site are not recirculated through the landfill cells and shall transport all such leachate and contaminated water to a disposal and treatment facility approved by the Director.
37. The Licencee shall ensure that:
 - a. the hydraulic capacity of the perforated leachate collection pipes can readily accommodate the expected quantity of leachate;

- b. leachate that enters the pipe can readily flow within the pipes;
 - c. blockage of the perforations of the leachate collection pipes by sedimentation is minimized;
 - d. the leachate collection pipes have adequate structural integrity to withstand impacts from waste placement and other site operations; and
 - e. the leachate system is inspected annually.
38. The Licencee shall ensure that at minimum:
- a. an attendant is on duty at the gate and scale at all times during hours of operation;
 - b. gates are provided for all access locations to the site;
 - c. the gates are kept locked when the necessary attendants are not on duty or the Development is closed; and
 - d. other attendants to direct traffic and operate heavy equipment are put on duty as required.
39. The Licencee shall ensure that bulky metallic wastes are:
- a. stored at a designated location above grade within the Development; and
 - b. stored for a period not exceeding one year.
40. The Licencee shall ensure that:
- a. recycling activities are carried out in a location separate from the active area(s);
 - b. appropriate signs are posted indicating which materials will be accepted for recycling; and
 - c. appropriate containers are provided for all materials being recycled.
41. The Licencee shall prior to commencing operation of the Development provide a plan for the approval of the Director for the installation of instruments capable of detecting radioactivity and notifying the site attendant(s) of such detection.
42. The Licencee shall ensure that:
- a. instruments as approved pursuant to Clause 41 of this Licence are installed; and
 - b. wastes with detectable radioactivity are not accepted at the Development.

Monitoring and Reporting

43. The Licencee shall submit to the Director at least 30 days before any wastes are deposited at the Development, a performance monitoring program for approval prior to the operation of the Development. The performance-monitoring program shall address, but not be limited to:
- a. obtaining background information on air, surface and groundwater quality prior to operation of the development;
 - b. ongoing monitoring during Development operation; and
 - c. the frequency of monitoring.
44. The Licencee shall ensure that construction of the wells in the network of the approved monitoring program, are undertaken in accordance with Appendix 5 - Guidelines for the Siting of a Class 1 Waste Disposal Ground in Manitoba, Guideline No. 94 - 01E supplement dated October, 1994.
45. The Licencee shall undertake the sampling and analysis of the background water quality for the chemical and microbiological parameters listed in Table 1 to this Licence. The sampling protocol is to be carried out in accordance with Appendix 7 - Guidelines for Sampling Protocol as specified in Manitoba Environment Guidelines for the Siting of a Class 1 Waste Disposal Ground in Manitoba, Guideline No. 94 - 01E supplement dated October, 1994, or other protocols as approved by the Director.

46. The Licencee shall ensure that the concentration values of the chemical and microbiological parameters listed in Table 1 to this Licence, are not exceeded over the background water quality at the relevant monitoring wells at the compliance boundary.
47. The Licencee shall develop an action plan to be implemented in the event that the monitoring program identifies any pollutant in air, surface or groundwater, as a result of the operation of the Development, in excess of background levels. The plan shall be submitted to the Director for approval within 60 days of the date of this Licence.
48. Where the Licencee fails to undertake the monitoring program approved pursuant to Clause 43 of this Licence, the Director may undertake such monitoring and recover the cost of such monitoring from the Licencee.
49. The Licencee shall ensure that records are kept for inspection at the R.M. of Ritchot municipal office for the following information:
 - a. the daily quantity of waste deposited at the site;
 - b. the number of samples collected to establish groundwater quality data;
 - c. details of all incidents requiring the implementation of the contingency action plan regarding groundwater or surface water pollution; and
 - d. all monitoring, testing and analytical data generated.
50. The Licencee shall submit to the Director the following information:
 - a. the results of the analysis of the chemical and microbiological parameters listed in Table 1 to this Licence, from the monitoring wells within 60 days from the end of each calendar year;
 - b. the annual quantity of wastes deposited at the waste disposal site within 60 days from the end of each calendar year; and
 - c. the details of all incidents requiring contingency action regarding groundwater or surface water pollution within 7 days from the occurrence of such incidents.

Financial Assurance/Insurance

51. The Licencee shall within 60 days of the date of this Licence and prior to commencing operation of the Development, provide to the Director confirmation of the following financial insurance coverage:
 - a. Environmental Impairment Liability insurance providing coverage subject to a minimum limit of \$1.0 million per occurrence or claim, including coverage for gradual, and sudden and accidental pollution. Coverage to include on-site and off-site clean up costs, and be placed with insurers satisfactory to the Province of Manitoba. The Province of Manitoba is to be added as an Additional Insured on the policy. The policy shall contain a clause stating that the Insurer will give Manitoba 60 days prior written notice in case of significant reduction in coverage or policy cancellation.
52. The Licencee shall provide the Director with a certificate of insurance as written evidence of required coverage, prior to commencing operations.

Contingency/Emergency Response Plans

53. The Licencee shall, 30 days prior to commencing operation of the Development, submit for the approval of the Director, a contingency plan relating to emergency planning and response at the development. The plan shall be developed and maintained in accordance with the *Industrial Emergency Response Planning Guide* (MIAC September, 1996) or other equivalent standard approved by the Director.

Closure and Post Closure

54. The Licencee shall submit to, and obtain approval from, the Director, prior to placing the Development into

operation, eight copies of a report and engineering design plans and details for the closure of the adjoining Class 2 waste disposal ground. In addition to providing the information requested in Schedule E - *Waste Disposal Ground Closure of Manitoba Regulation 150/91*, the report and engineering design plans shall address construction specifications and assessment criteria and include, but not be limited to, the following:

- a. details of the characteristics of the all material(s) which form the existing perimeter clay berm as well as those of the material(s) to be used in the closure of the existing Class 2 waste disposal ground;
 - b. details of the design of the perimeter clay berms and overall cell cover;
 - c. details of final contours and grades;
 - d. details of proposed re-vegetation and maintenance of the perimeter berms and cell cover;
 - e. details of the schedule for completion of all decommissioning activities for the Class 2 waste disposal ground;
 - f. assessment(s) of potential long-term impact to local aquifer(s);
 - g. details regarding monitoring components and program(s) for potential environmental impacts resulting from the decommissioned Class 2 waste disposal ground; and
 - h. a timeline for commencing and completing the closure of the adjoining Class 2 waste disposal ground.
55. The Licencee shall submit, within one year of the date of issuance of this Licence, for the approval of the Director, a Preliminary Closure and Post Closure Plan for the Development. The plan shall include, but not be limited to, information with respect to:
- a. final cover design and maintenance;
 - b. maintenance of leachate detection;
 - c. groundwater monitoring;
 - d. landfill gas monitoring; and
 - e. financial assurance/insurance required to implement the Plan.
56. The Licencee shall submit for the approval of the Director, within one year prior to imminent closure of the Development, a formal detailed Closure and Post Closure Plan for the Development.
57. The Licencee shall implement and maintain the approved Closure and Post Closure Plan for the Development.

As-Constructed Drawings

58. The Licencee shall:
- a. prepare "as constructed drawings" for the Development and shall label the drawings "as Constructed"; and
 - b. provide to the Director, 30 days after completion of construction, two sets of "as constructed" drawings of the waste disposal ground and all appurtenances.

REVIEW AND REVOCATION

- A. If, in the opinion of the Director, the Licencee has exceeded or is exceeding or has or is failing to meet the specifications, limits, terms, or conditions set out in this Licence, the Director may, temporarily or permanently, revoke this Licence.
- B. If, in the opinion of the Director, new evidence warrants a change in the specifications, limits, terms or conditions of this Licence, the Director may require the filing of a new proposal pursuant to Section 11 of The Environment Act.
- C. The Financial Assurance/Insurance requirements of this Licence shall be reviewed, affirmed or amended by the Director at five-year intervals.

"original signed by"
Larry Strachan, P. Eng.
Director
Environment Act

Client File No.: 4412.00

**TABLE 1 - TO ENVIRONMENT ACT LICENCE NO. 2482 R
BACKGROUND WATER QUALITY CHEMICAL AND MICROBIOLOGICAL PARAMETERS**

| Parameter | Notes |
|--------------------------------|--------------|
| Alkalinity-bicarbonate | Dissolved |
| Alkalinity-carbonate | Dissolved |
| Alkalinity-hydroxide | Dissolved |
| Alkalinity-total | Dissolved |
| Hardness- as CaCO ₃ | Dissolved |
| pH-units | Dissolved |
| Specific Conductivity | Dissolved |
| Turbidity-NTU | |
| Residue-filterable | |
| Residue-non filterable | |
| Residue-total | |
| Chloride | Dissolved |
| Sulphate | Dissolved |
| Cyanide-total | Dissolved |
| Ammonia | Dissolved |
| Nitrate-Nitrite-Nitrogen | Dissolved |
| Total Kjeldhal Nitrogen | Dissolved |
| Phosphorous | Dissolved |
| Arsenic | Dissolved |
| Barium | Dissolved |
| Beryllium | Dissolved |