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Title 22@ Social Security

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Division 4.5@ Environmental Health Standards for the Management of Hazardous Waste

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Chapter 14@ Standards for Owners and Operators of Hazardous Waste Transfer, Treatment, Storage, and Disposal Facilities

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Article 13@ Land Treatment

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Section 66264.278@ Vadose Zone Monitoring and Response

66264.278 Vadose Zone Monitoring and Response

In addition to the water quality monitoring and response requirements of article 6 and the environmental monitoring requirements of article 17 of this chapter, an owner or operator subject to this article shall establish a vadose zone monitoring program to discharge the following responsibilities.

(a)

The owner or operator shall monitor the soil and soil-pore liquid to determine whether constituents of concern migrate out of the treatment zone. (1) The Department will specify the constituents of concern to be monitored in the facility permit. The constituents of concern to be monitored are those specified under section 66264.271(b). (2) The Department may require monitoring for principal constituents of concern in lieu of the constituents specified under section 66264.271(b). Principal constituents of concern are the constituents contained in the wastes to be applied at the unit that are the most difficult to treat, considering the combined effects of degradation, transformation, and immobilization. The Department may establish principal constituents of concern if it finds, based on waste analyses, treatment demonstrations, or other data, that effective degradation, transformation, or immobilization of the constituent will assure treatment at at least equivalent levels for the other constituents of concern in the wastes.

(1)

The Department will specify the constituents of concern to be monitored in the facility permit. The constituents of concern to be monitored are those specified under section 66264.271(b).

(2)

The Department may require monitoring for principal constituents of concern in lieu of the constituents specified under section 66264.271(b). Principal constituents of concern are the constituents contained in the wastes to be applied at the unit that are the most difficult to treat, considering the combined effects of degradation, transformation, and immobilization. The Department may establish principal constituents of concern if it finds, based on waste analyses, treatment demonstrations, or other data, that effective degradation, transformation, or immobilization of the constituent will assure treatment at at least equivalent levels for the other constituents of concern in the wastes.

(b)

The owner or operator shall install a vadose zone monitoring system that includes soil monitoring using soil cores and soil-pore liquid monitoring using devices such as lysimeters. The vadose zone monitoring system shall consist of a sufficient number of sampling points at appropriate locations and depths to yield samples that: (1) represent the quality of background soil-pore liquid quality and the chemical make-up of soil that has not been affected by leakage from the treatment zone; and (2) indicate the quality of soil-pore liquid and the chemical make-up of the soil below the treatment zone.

(1)

represent the quality of background soil-pore liquid quality and the chemical make-up of soil that has not been affected by leakage from the treatment zone; and

(2)

indicate the quality of soil-pore liquid and the chemical make-up of the soil below the treatment zone.

(c)

The owner or operator shall establish a background concentration for each constituent of concern to be monitored under subsection (a) of this section. The permit will specify the background concentrations for each constituent or specify the procedures to be used to calculate the background concentrations. (1) Background soil concentrations may be based on a one-time sampling at a background plot having characteristics similar to those of the treatment zone. (2) Background soil-pore liquid concentrations shall be based on at least quarterly sampling for one year at a background plot having characteristics similar to those of the treatment zone. (3) The owner or operator shall express all background concentrations in a form necessary for the determination of statistically significant increases under subsection (f) of this section. (4) In taking samples used in the determination of all background concentrations, the owner or operator shall use a vadose zone monitoring system that complies with subsection (b)(1) of this section.

(1)

Background soil concentrations may be based on a one-time sampling at a background plot having characteristics similar to those of the treatment zone.

(2)

Background soil-pore liquid concentrations shall be based on at least quarterly sampling for one year at a background plot having characteristics similar to those of the treatment zone.

(3)

The owner or operator shall express all background concentrations in a form necessary

for the determination of statistically significant increases under subsection (f) of this section.

(4)

In taking samples used in the determination of all background concentrations, the owner or operator shall use a vadose zone monitoring system that complies with subsection (b)(1) of this section.

(d)

The owner or operator shall conduct soil monitoring and soil-pore liquid monitoring immediately below the treatment zone. The Department will specify the frequency and timing of soil and soil-pore liquid monitoring in the facility permit after considering the water quality monitoring requirements of article 6 of this chapter, the frequency, timing, and rate of waste application, and the soil permeability. The owner or operator shall express the results of soil and soil-pore liquid monitoring in a form necessary for the determination of statistically significant increases under subsection (f) of this section.

(e)

The owner or operator shall use consistent sampling and analysis procedures that are designed to ensure sampling results that provide a reliable indication of soil-pore liquid quality and the chemical make-up of the soil below the treatment zone. At a minimum, the owner or operator must implement procedures and techniques for: (1) sample collection; (2) sample preservation and shipment; (3) analytical procedures; and (4) chain of custody control.

(1)

sample collection;

(2)

sample preservation and shipment;

(3)

analytical procedures; and

(4)

chain of custody control.

(f)

The owner or operator shall determine whether there is a statistically significant change over background values concentrations for each constituent of concern to be monitored under subsection (a) of this section below the treatment zone each time the owner or operator conducts soil monitoring and soil-pore liquid monitoring under subsection (d) of this section. (1) In determining whether a statistically significant increase has occurred, the owner or operator shall compare the value concentration of each constituent, as determined under subsection (d) of this section, to the background concentration for that constituent according to the statistical procedure specified in the facility permit under this subsection. (2) The owner or operator shall determine whether there has been a statistically significant increase below the treatment zone within a reasonable time period after completion of sampling. The Department will specify that time period in the facility permit after considering the complexity of the statistical test and the availability of laboratory facilities to perform the analysis of soil and soil-pore liquid samples. (3) The owner or operator shall determine whether there is a statistically significant increase below the treatment zone using a statistical procedure that provides reasonable confidence that migration from the treatment zone will be identified. The Department will specify a statistical procedure in the facility permit that it finds: (A) is appropriate for the distribution of the data used to establish background concentrations; and (B) provides a reasonable balance between the probability of falsely identifying migration from the treatment zone

and the probability of failing to identify real migration from the treatment zone.

(1)

In determining whether a statistically significant increase has occurred, the owner or operator shall compare the value concentration of each constituent, as determined under subsection (d) of this section, to the background concentration for that constituent according to the statistical procedure specified in the facility permit under this subsection.

(2)

The owner or operator shall determine whether there has been a statistically significant increase below the treatment zone within a reasonable time period after completion of sampling. The Department will specify that time period in the facility permit after considering the complexity of the statistical test and the availability of laboratory facilities to perform the analysis of soil and soil-pore liquid samples.

(3)

The owner or operator shall determine whether there is a statistically significant increase below the treatment zone using a statistical procedure that provides reasonable confidence that migration from the treatment zone will be identified. The Department will specify a statistical procedure in the facility permit that it finds: (A) is appropriate for the distribution of the data used to establish background concentrations; and (B) provides a reasonable balance between the probability of falsely identifying migration from the treatment zone and the probability of failing to identify real migration from the treatment zone.

(A)

is appropriate for the distribution of the data used to establish background concentrations;
and

(B)

provides a reasonable balance between the probability of falsely identifying migration from the treatment zone and the probability of failing to identify real migration from the treatment zone.

(g)

Except as provided in section 66264.273(1), no person shall place or dispose of hazardous waste in a land treatment unit if any of the following conditions exist:

(1) hazardous constituents have migrated from the land treatment unit into the vadose zone beneath or surrounding the treatment zone or into the waters beneath or surrounding the treatment zone; (2) there is evidence that a hazardous constituent in the waste discharged to the land treatment unit has not been or will not be completely degraded, transformed or immobilized in the treatment zone; (3) there is a significant potential for hazardous constituents to migrate from the land treatment unit into a potential source of drinking water.

(1)

hazardous constituents have migrated from the land treatment unit into the vadose zone beneath or surrounding the treatment zone or into the waters beneath or surrounding the treatment zone;

(2)

there is evidence that a hazardous constituent in the waste discharged to the land treatment unit has not been or will not be completely degraded, transformed or immobilized in the treatment zone;

(3)

there is a significant potential for hazardous constituents to migrate from the land treatment unit into a potential source of drinking water.

(h)

The owner or operator shall periodically, at the request of the Department, and at

least annually, submit information required by the Department to assure that the conditions set forth in subsections (g)(1) and (g)(2) of this section are not present. The information shall include, but is not limited to the results of soil and soil-pore liquid monitoring conducted under subsection (d) of this section.

(i)

If the owner or operator determines pursuant to subsection (f) of this section, that there has been a statistically significant increase in the concentration of a hazardous constituent below the treatment zone, or that either of the conditions set forth in subsections (g)(1) or (g)(2) of this section are detected and confirmed, or that conditions exist that render the owner or operator unable to continue to satisfy the variance requirements of section 66264.273(j)(2), the owner or operator shall, within 72 hours, report to the Department describing the full extent of the owner's or operator's findings, including the identification of all constituents which have shown a statistically significant increase.

(j)

Upon receiving notice pursuant to subsection (i) of this section, or upon independent confirmation by the Department, the Department shall order the owner or operator to cease operating the land treatment unit. The owner or operator shall not resume operating the land treatment unit and shall close the land treatment unit unless one of the following actions is taken: (1) the owner or operator completes appropriate removal or remedial actions to the satisfaction of the Department, and the owner or operator submits to the Department, and the Department approves, an application for a permit or a variance modification to modify the operating practices at the facility to maximize the success of degradation, immobilization, or transformation processes in the treatment zone; or (2) the owner or operator completes appropriate removal or remedial actions,

submits to the Department, and the Department approves, an application for a permit or a variance modification to modify the operating practices at the facility to maximize the success of degradation, immobilization, or transformation processes in the treatment zone, and equips the land treatment unit with liners and a leachate collection and removal system that satisfy the requirements of section 66264.273(j)(1).

(1)

the owner or operator completes appropriate removal or remedial actions to the satisfaction of the Department, and the owner or operator submits to the Department, and the Department approves, an application for a permit or a variance modification to modify the operating practices at the facility to maximize the success of degradation, immobilization, or transformation processes in the treatment zone; or

(2)

the owner or operator completes appropriate removal or remedial actions, submits to the Department, and the Department approves, an application for a permit or a variance modification to modify the operating practices at the facility to maximize the success of degradation, immobilization, or transformation processes in the treatment zone, and equips the land treatment unit with liners and a leachate collection and removal system that satisfy the requirements of section 66264.273(j)(1).

(k)

All actions taken by an owner or operator pursuant to subsections (j)(1) or (j)(2) of this section shall be completed within a time period specified by the Department, which shall not exceed 18 months after the Department receives notice pursuant to subsection (i) of this section. If the actions are not completed within this time period, the land treatment unit shall be closed, unless granted an extension by the Department due to exceptional circumstances beyond the control of the

owner and operator.

(I)

If the owner or operator determines, pursuant to subsection (f) of this section, that there is a statistically significant increase of hazardous constituents below the treatment zone, the owner or operator may demonstrate that a source other than the land treatment unit caused the increase or that the increase resulted from an error in sampling, analysis, or evaluation. While the owner or operator may make a demonstration under this subsection in addition to, or in lieu of the requirements under subsections (j)(1) or (j)(2) of this section, the owner or operator is not relieved of the requirements of subsections (j) and (k) of this section unless the demonstration made under this subsection successfully shows that a source other than the land treatment unit caused the increase or that the increase resulted from an error in sampling, analysis, or evaluation. In making a demonstration under this subsection, the owner or operator shall: (1) notify the Department in writing within seven days of determining a statistically significant increase below the treatment zone that the owner or operator intends to make a determination under this subsection; (2) within 90 days, submit a report to the Department demonstrating that a source other than the regulated units caused the increase or that the increase resulted from error in sampling, analysis, or evaluation; (3) within 90 days, submit to the Department an application for a permit modification to make any appropriate changes to the vadose zone monitoring program at the facility; and (4) continue to monitor in accordance with the vadose zone monitoring program established under this section.

(1)

notify the Department in writing within seven days of determining a statistically significant increase below the treatment zone that the owner or operator intends to

make a determination under this subsection;

(2)

within 90 days, submit a report to the Department demonstrating that a source other than the regulated units caused the increase or that the increase resulted from error in sampling, analysis, or evaluation;

(3)

within 90 days, submit to the Department an application for a permit modification to make any appropriate changes to the vadose zone monitoring program at the facility; and

(4)

continue to monitor in accordance with the vadose zone monitoring program established under this section.