# DRAFT Practices for Sensitive Areas

**from DNR and Kewaunee County staff**

**This document intended for Sensitive Areas and Practices Workgroup discussion.**

**This is NOT a final determination by either DNR or Kewaunee County.**

**Sensitive Areas consist of:**

| Priority | Criteria |
|---|---|
| **1** | **Less than 5 feet (60 inches) to carbonate bedrock *and/or* closed depressions or any drainage areas that contribute water to sinkholes/bedrock openings on field** |
| **2** | **5-20 feet to carbonate bedrock** |
| **3** | **> 20 feet to carbonate bedrock** |

NOTE: Kewaunee County Public Health and GW Protection Ordinance prohibits waste application (liquid and solid) on soils with less than 20 feet to bedrock:

- **between Jan 1-April 15** – exemption allowed;
- **when soils are frozen, snow covered or saturated** - may apply to Nov and Dec;
- **when snow is actively melting such that water is flowing off the field** - may apply to late April or May in some years;
- **precipitation capable of producing runoff is forecast within 24 hours of application**
    - may apply to May, June or July

## Before Application on fields with Sensitive Areas

1. Inspect fields for GW conduits, contributing channels or areas to drain to GW conduits, drain tiles that may drain/discharge to groundwater conduits and evidence of fracture traces. Keep inspection log.
    a. Best times to inspect are before planting/ tillage in spring or later in summer or fall after crop harvest and before tillage/waste application(s).
2. Evaluate alfalfa fields for evidence of fracture traces. Keep inspection log.
    a. Best times to inspect are before or a week after harvest – look for uneven crop growth that follows distinct lines
3. Use Ground Penetrating Radar prior to application to identify/confirm shallow rock depth and/or features on field

4. Permanently mark sinkholes or other rock features in field and install 5 ft vegetated buffer around feature.
5. Rank fields for low, medium and high risk; avoid high risk fields for application
    a. Risk based on amount of restricted area and presence of karst features on field (e.g., karst density in field > 1 per acre, > 30% field area has visible fracture traces, channel(s) in field that lead to groundwater conduit)
6. Plant 90 day vs 120 day corn to increase manure application window
7. Identify field areas with less than 5 feet to bedrock depth and complete pre tillage to break up soil cracks/macropores and increase soil retention treatment.
    a. does not apply to established alfalfa; may apply to some cover crops
    b. clay soil content considerations?
8. Stop tilling through re-occuring gullies/concentrated flow channels on fields that lead rock features/groundwater conduits; update maps to reflect channels
9. Use LIDAR and/or topography maps to identify closed depression areas and associated drainage areas that contribute runoff to identified GW conduits
10. Check known drain tile outlets for discharge/flow. Keep log of inspections.
11. Develop plan for liquid waste applications on frozen and snow covered soils that includes the following requirements:
    a. Notify LCD prior to application
    b. 300 ft setbacks from identified GW conduits
    c. 200 ft setback from channels that lead/discharge to GW conduits
    d. Identification of low, medium and high risk fields based upon setbacks above
        i. Risk based on amount of restricted area and presence of karst features on field (e.g., karst density in field > 1 per acre, > 30% field area has visible fracture traces, channel(s) in field that lead to groundwater conduit)
    e. Lower application rates (< or equal to 7000 gal/acre) or 60 lbs P205

## During Application on fields with Sensitive Areas – Growing season

1. Keep and Submit Inspect Log of Manure applied and where with annual NMP – records are currently required by 590/243 or Manure Storage Ordinance
2. Follow practices based upon waste type:
    a. Liquids – treated and untreated? How to define treatment?
    b. Solids (> 11% DM) – treated or untreated?
        i. Treated waste = lower risk for pathogen contamination

ii. Solid waste = lower risk for nutrient and pathogen loss

3. No application on soils with 2 or 3 feet to bedrock depth

   Note: NR 243 currently requires 2 foot bedrock depth setback

4. For soils less than 5 feet to bedrock:
   a. surface apply with conventional equipment; do not apply > 12,000 gal/acre/application; complete pre-tillage except for established alfalfa
   b. No injection unless pre-tillage completed
5. Manure Irrigation – apply on established crops and follow setbacks from features to reduce pathogen drift risk
6. Setbacks (100 - 200 ft) from:
   a. direct conduits to groundwater conduits
   b. channels that drain to these features;
      i. Consider impact to available acres; more risk for over application of nutrients - Nutrient Balance issues?
7. For liquid waste, check field for surface runoff to GW conduits and channels that drain to GW conduits. Stop application if runoff occurs. Immediately implement containment measures to prevent more runoff. Report discharge to county LCD and DNR.
8. For liquid waste, check identified drain tile outlets for discharge to GW conduits or channels that drain to GW conduits. Stop application if discharge occurs. Immediately implement containment measures and report discharge to county LCD and DNR

## After Application on fields with Sensitive Areas – Growing Season

1. For soils less than 5 feet to bedrock:
   a. Complete tillage immediately after conventional surface application; does not apply to injection
   2. Repeat items 7 and 8 above after application is complete.

## Specific Situations/Examples

**Field has ID bedrock feature swallet/hole/rock pile OR drain tile/channel that leads to BR feature OR fracture traces/cracks over > 30% of field area:**

- Complete pre tillage or immediately incorporate surface applied waste; no injection (unless pre-tillage).
- For Untreated waste - use 2 or more applications; no single application > 12,000 gal/acre.
- For treated waste = one application allowed

**Fields with ID Bedrock feature - swallet/hole/rock pile**

- 100 ft setback from bedrock feature OR, if identified, avoid application in contributing area to feature
- On remaining area of field:
  - complete pre-tillage or immediately incorporate surface applied waste; no injection (unless pre-tillage)
  - Untreated waste – 2 or more applications; no single application > 7,000 gal/acre AND complete pre tillage or immediately incorporate; no injection (unless pre-tillage).
  - Treated waste = one application (no rate limit) AND pre tillage or immediately incorporation; injection allowed.

**Fields with ID Bedrock feature and contributing channel:**

- 100 ft setback from contributing channel when waste is surface applied OR
- 50 ft setback if pre tillage or immediately incorporated OR
- 25 ft setback if pre till or immediately incorporated and waste has reduced pathogens (e.g., digested manure tested repeatedly and confirmed with reduced pathogens).

**Fields with ID GW recharge area or closed depression area that leads to ID BR feature:**

- Avoid recharge/depressional area if possible;
- Apply untreated waste with 2 or more applications; no single application > 7,000 gal/acre AND complete pre tillage or immediately incorporate; no injection w/o pre-tillage
- Treated waste = one application (no rate) AND pre tillage or immediately incorporation; injection allowed