Upper Elkhorn Natural Resources District
Groundwater Quality Management Area Controls

- **Phase III Groundwater Quality Management Areas - > 90% of the MCL (> 9.0 ppm nitrate-nitrogen)**

1. All rules and regulations established for Phases I & II will remain in effect unless modified or negated by Phase III requirements.

2. If the groundwater analysis from Phase I, #2 and reported in Phase II, #3(c) shows nitrate-nitrogen levels greater than (90)% of the MCL, then the groundwater analysis for nitrate-nitrogen in Phase I, #2 must be made annually and results submitted in the report discussed in Phase II, #3 (c). In other words, the groundwater analysis required prior to recertification (once every four years) in a Phase I GWQMA, now must be conducted on an annual basis if the nitrate-nitrogen levels exceed 90% of the MCL or 9.0 ppm in the case of nitrate-nitrogen.

3. If a town, village, or city lies within a Phase III Area, will be encouraged to complete a Well Head Protection Area Plan. The Upper Elkhorn NRD will provide assistance to the communities for completing this plan.

4. Randomized soil sampling will be conducted in the Phase III areas to identify fields, which are larger than 40 acres with more than 50 lbs/ac of actual nitrogen applied, with high residual soil nitrate-nitrogen. UENRD staff or contracted workers/agronomists will collect deep soil samples (three foot samples) based on proper soil sampling protocol from University of Nebraska-Lincoln (UNL) NebGuide G1740, "Guidelines for Soil Sampling." Following these guidelines, for every 40 acres, 10-15 randomly collected surface cores (0-8" deep) and 6-8 subsoil cores (8-36" deep) will be collected and analyzed for nitrate-nitrogen analysis.

   a. **Analysis**: Samples will be shipped to and analyzed by an NRD approved agricultural analysis laboratory. Soil sample analysis will be conducted for each sampled field for pounds of nitrate-nitrogen per acre (lbs/ac) and will fall within the following Trigger Levels:
   No Trigger: 0 – < 40 lbs/ac
   Level 1: ≥ 40 – < 50 lbs/ac
   Level 2: ≥ 50 – < 60 lbs/ac
   Level 3: ≥ 60 lbs/ac
      i. If any portion of the field triggers a higher level, the whole field will be considered to trigger the higher level. For example, if a field is analyzed by the north half and south half, and if the north half is 30 lbs/ac and the south half is 40 lbs/ac, the entire field will be considered Level 1.

   b. **Timing**: Samples will be collected in the fall, after harvest, to determine the amount of nitrate-nitrogen left in the soil. Samples will be taken from fields in either a one or three year program. Samples will only be taken from fields with more than 50 lbs/ac of actual nitrogen applied (i.e., corn

fields) in Year 1, seeing as little to no nitrogen is commonly applied to beans. If the field has < 40 lbs/ac residual nitrate-nitrogen in Year 1, the field will not need to be retested. If the field is ≥ 40 lbs/ac residual nitrate-nitrogen, the same field will also be tested in Year 2 and Year 3. This is because of the common crop rotation of corn then beans, so the field will need to be tested in Year 2 (beans) and again in Year 3 (corn) to assess the producer's nitrogen management.

c. **Triggers**: The landowner, operator, and/or nitrogen applicator (henceforth "the party") will be notified of their lbs/ac of nitrate-nitrogen every year that the field is sampled. If the field has > 40 lbs/ac of residual nitrate-nitrogen, the party will be provided a list of potential Best Management Practices (Appendix A) which are reasonably considered to achieve compliance with Phase III Controls. If the field does not trigger (< 40 lbs/ac) in Year 1, the party will be notified of their result and no more testing for Phase III will be required, unless selected in the future.

   i. If a field triggers Level 1: The landowner, operator, and/or nitrogen applicator will be required to reduce the amount of residual nitrate-nitrogen the following years to below 40 lbs/ac. The field will be sampled for a minimum of two more years.
      1. **If in Year 2, the field triggers:**
         a. No Trigger: The field will be tested for one more year.
         b. Level 1: The party will be required to reduce level below 40 lbs/ac. The field will be tested for one more year.
         c. Level 2 or 3: The party will meet with UENRD, and will be required to reduce level below 40 lbs/ac. The field will be tested for one more year. The landowner will be required to pay for the cost of the soil sample for Year 3.
      2. **If in Year 3, the field triggers:**
         a. No Trigger: No more testing will be required, unless selected in the future.
         b. Level 1: The party will be required to reduce level below 40 lbs/ac. The field will be tested for a minimum of one more year, and the landowner will be required to pay for the cost of the soil sample for Year 4 and beyond; see Section 4.C.iv.
         c. Level 2 or 3: The party will meet with UENRD, and will be required to reduce level below 40 lbs/ac. The field will be tested for a minimum of one more year, and the landowner will be required to pay for the cost of the soil sample for Year 4 and beyond; see Section 4.C.iv.

   ii. If a field triggers Level 2: The field will be sampled for a minimum of two more years and will be required to reduce the amount of residual nitrate-nitrogen the following years to below 40 lbs/ac.
      1. **If in Year 2, the field triggers:**
         a. No Trigger: The field will be tested for one more year.
         b. Level 1: The field will be tested for one more year. The party will be required to reduce level below 40 lbs/ac.
         c. Level 2 or 3: The field will be tested for one more year. The party will meet with UENRD, and will be required to reduce level below 40 lbs/ac. "Failure to Reduce" procedures may go into effect, see Section 4.D. The landowner will be required to pay for the cost of the soil sample for Year 3.
      2. **If in Year 3, the field triggers:**

a. No Trigger**:** No more testing will be required, unless selected in the future.
b. Level 1: The party will be required to reduce level below 40 lbs/ac. The field will be tested for a minimum of one more year, and the landowner will be required to pay for the cost of the soil sample for Year 4 and beyond; see Section 4.C.iv.
c. Level 2 or 3: The party will meet with the UENRD, and will be required to reduce level below 40 lbs/ac. The field will be tested for a minimum of one more year, and the landowner will be required to pay for the cost of the soil sample for Year 4 and beyond; see Section 4.C.iv. "Failure to Reduce" procedures may go into effect, see Section 4.D.

iii. If a field triggers Level 3: The landowner, operator, and/or nitrogen applicator will be required to meet with the UENRD Water Committee to explain why the residual nitrate-nitrogen was above the limit for that field for that season. The field will be sampled for a minimum of two more years and will be required to reduce the amount of residual nitrate-nitrogen the following years to below 40 lbs/ac.

1. **If in Year 2, the field triggers:**
   a. No Trigger: The field will be tested for one more year.
   b. Level 1: The field will be tested for one more year. The party will be required to reduce level below 40 lbs/ac.
   c. Level 2 or 3: The field will be tested for one more year. The party will meet with UENRD, and will be required to reduce level below 40 lbs/ac. "Failure to Reduce" procedures may go into effect, see Section 4.D. The landowner will be required to pay for the cost of the soil sample for Year 3.
2. **If in Year 3, the field triggers:**
   a. No Trigger**:** No more testing will be required, unless selected in the future.
   b. Level 1: The party will be required to reduce level below 40 lbs/ac. The field will be tested for a minimum of one more year, and the landowner will be required to pay for the cost of the soil sample for Year 4 and beyond; see Section 4.C.iv.
   c. Level 2 or 3: The party will meet with the UENRD, and will be required to reduce level below 40 lbs/ac. The field will be tested for a minimum of one more year, and the landowner will be required to pay for the cost of the soil sample for Year 4 and beyond; see Section 4.C.iv. "Failure to Reduce" procedures may go into effect, see Section 4.D.

iv. Year 4 and beyond: If a field has yet to get below 40 lbs/ac after the first three years, continued soil sampling will occur. The landowner will be responsible for the cost of the soil sample. Sampling will occur yearly until the field is below 40 lbs/ac.

d. **Failure to Reduce:** Any party that fails to reduce residual nitrate-nitrogen to levels below 40 lbs/ac as described above, will receive a notice of violation and may receive a cease and desist order. The cease and desist order may order the immediate cessation of the application of nitrogen, the reduction or cessation of irrigation, the reduction or removal of certified irrigated acres, or such other measure authorized pursuant to Neb. Rev. Stat. 46-739, that are reasonably considered to achieve compliance with this section, as determined by the Upper Elkhorn Board of Directors.

e. **Field Selection**: Fields will be randomly selected within the Phase III designated townships annually. The UENRD staff or contracted workers/agronomists will contact the landowner and/or operator to determine crop for that field; only fields that are larger than 40 acres with more than 50 lbs/ac of actual nitrogen applied during that growing season will be tested.

5. The application of commercial nitrogen fertilizer is prohibited on all soils until after **March 1**. Spring (*March 1 to June 20*) application of commercial nitrogen fertilizer at a rate of **over 100 pounds of actual nitrogen per acre** will require split applications (i.e. pre-plant, post emergence side dress, weed and feed, planting time, and through the center pivot, if applicable).

6. If the Board of Directors deems it necessary to maintain, enhance, or protect groundwater quality, or to address concerns regarding conjunctive use and adverse effects on groundwater quality, the UENRD may choose to implement additional controls as listed in Nebraska State Statutes 46-739. Some of the controls in this Statute are groundwater allocation and irrigated acre reduction.

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Appendix A:

List of potential Best Management Practices:

- Soil moisture probes/tensiometers
- Flowmeters and flowmeter monitoring and management
- Irrigation scheduling, rain gauges, etc.
- Rain interrupters on irrigation systems
- Irrigation allocations / Irrigation rotation / Reduce irrigated acres
- Proper timing of fertilizer application
- Nitrogen inhibitors/slow release nitrogen
- Use of UNL fertilizer recommended rate
- Split application / utilization of chemigation
- Review nitrogen receipts (and compare to UNL recommendation)
- Review yield receipts
- Chlorophyll meters / Crop growth infrared sensors
- Pre-cropping reporting and post-cropping reporting
- New well drilling rules regarding depth and casings
- Test plots
- Denitrification ponds/buffer strips
- Cover crops
- Crop rotation
- Further requirements for livestock waste (lab analysis, credit must be taken)
- Or other criteria allowed under Neb. Rev. Stat. 46-739