Nishnabotna Fertilizer Spill NRDAR

Preassessment Screen and Determination

October 25, 2024

Prepared by the Nishnabotna Trustee Council:

Missouri Department of Natural Resources, Iowa Department of Natural Resources, Nebraska Department of Environment and Energy, and U.S. Fish and Wildlife Service

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I. Introduction and Purpose

The Missouri Department of Natural Resources (MoDNR), the Iowa Department of Natural Resources (IDNR), the Nebraska Department of Environment and Energy (NDEE), and the U.S. Department of Interior (DOI) through the U.S. Fish and Wildlife Service (USFWS), (collectively, the "Trustees"), may pursue claims for natural resource damages under Section 107(f) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA).

This document is a preassessment screen (PAS) prepared by the Trustees pursuant to 43 CFR Part 11 for the Nishnabotna Fertilizer Spill. Before pursuing further Natural Resource Damage Assessment (NRDA) efforts, the Trustees complete a PAS and make a determination as to whether an assessment shall be carried out. The purpose of the PAS is to provide a rapid review of readily available information that focuses on resources and services for which the Federal or State agency or Indian Tribe may assert trusteeship under Section 107(f) or Section 126(d) of CERCLA. This review should ensure that there is a reasonable probability of making a successful claim before monies and efforts are expended in carrying out an assessment (43 CFR § 11.23(b)).

II. Description of the Site and Hazardous Substances and/or Oil Released

The Nishnabotna Fertilizer Spill originated in Red Oak, Iowa, in Montgomery County along the East Nishnabotna River. The Nishnabotna River is a tributary of the Missouri River in southwestern Iowa, northwestern Missouri, and southeastern Nebraska, and flows for most of its length as two parallel streams in Iowa: the East Nishnabotna River and the West Nishnabotna River. The East Nishnabotna River Watershed (ENRW) encompasses 696,400 acres and touches 10 counties in Southwest Iowa. The ENRW is part of the Nishnabotna Basin, which drains to the Missouri River, a crucial water body that provides feeding, breeding, and resting areas for hundreds of species of birds and fish. The ENRW is in the Southern Iowa Drift Plain Region, characterized by glacial deposits that have been left behind by ice sheets over 500,000 years ago. The deposits have been carved by stream erosion, creating broad rolling uplands and deep valleys adjoining woodland areas that provide abundant habitat for wildlife and recreation. The Nishnabotna River flows into the Missouri River near Peru, Nebraska. Both provide suitable habitat for the federally endangered Pallid Sturgeon (*Scaphirhynchus albus*) and the federally threatened due to similarity of appearance, Shovelnose Sturgeon (*Scaphirhynchus platorynchus*). These sturgeon species are native to the mainstem of the Missouri River (USFWS 2014). However, given its connection as a tributary and its morphology, the Nishnabotna River can also support and is frequented by these sturgeon species.

From March 9-11, 2024, the NEW Cooperative Inc. (NEW) facility in Red Oak, IA, released 1,500 tons (265,000 gallons) of liquid nitrogen fertilizer (UAN-32) through a valve left open, which flowed over a graveled parking area into a stormwater drainage ditch and then flowed into the East Nishnabotna

River (anywhere contaminants have come to be located is collectively referred to herein as the "Site"). The release was discovered at 5:30 a.m. on March 11, 2024, by NEW employees who used soil to block the ditch and stop further contamination into the river. NEW notified IDNR of a release occurring on-site. The UAN-32 had been stored in a 500,000-gallon tank with secondary containment to prevent overland flow in the event of a leak. From this tank, UAN-32 is transported through a pipe to a nearby building, with no additional containment, to be distributed to trucks for transport off-site. UAN-32 began to freely flow out of the open valve and into the surrounding environment.

Upon learning of the release, IDNR staff from the Environmental Field Office worked with the NEW staff to stop the release and begin cleanup efforts. The flow of the river caused the pollutant to flush down into the Missouri River. The U.S. Environmental Protection Agency (EPA) Region 7 also deployed an On-Scene Coordinator (OSC) on March 11th to the NEW facility. Containment and recovery efforts included building berms and dams to retain product on the property, wet vacuuming product from the containment pad into a frac tank, removing trees to access areas for soil excavation, closing the flood gate to the East Nishnabotna River, pumping surface runoff from the stormwater ditch into mobile tanks, excavating soil, and hiring a consultant to assist with remediation efforts. Water containing elevated levels of UAN-32 was stored in onsite frac tanks and removed soil was stockpiled with scraped soil from the gravel lot. As of July 30, NEW has removed and land applied approximately 1,600 tons of soil and 204,000 gallons of surface water at various locations approved by IDNR.

UAN-32 is used as a fertilizer to deliver phased release crop feeding. It is a clear to pale, water-soluble solution and derives its nitrogen from ammonium nitrate and urea. These compounds are then mixed with water to create the final solution. While ammonia is commonly considered to be toxic to all vertebrates, ammonia may be acutely toxic to fish, resulting in neurological disfunction culminating in coma and death often referred to as "acute ammonia intoxication" (Randall 2002). When UAN-32 is introduced into a water solution, a hydrolytic reaction readily occurs that produces Un-ionized ammonia (NH_3) and carbon dioxide (CO_2). Un-ionized Ammonia is about 100 times more toxic to fish than ionized ammonia. Un-ionized Ammonia concentrations of 1.00 mg/L have demonstrated lethal effects to fish and sub-lethal effects have been observed at concentrations as low as 0.05 mg/L (Francis-Floyd et al. 2012; Noga 2010). In addition, EPA has long recognized the toxicity of ammonia and established an acute criterion magnitude of 17 mg/L Total Ammonia Nitrogen (TAN) for aquatic life (EPA 2013).

The March 9-11, 2024, UAN-32 release resulted in a mass fish kill in the Nishnabotna River, ending near the confluence of the Nishnabotna and Missouri Rivers, with a total impact of 60.39 miles (Figure 1). Due to the release, IDNR recommended the public avoid all recreational activities within the impacted river reach, including fishing and consumption advisories against collecting or eating dead fish. In addition to the fish kill, the release had impacts to water quality and potentially negative effects to other species, and wetland, marsh, and riparian habitat. Two wildlife management areas (WMAs) managed by IDNR run along the Nishnabotna River: the Riverton Wildlife Management Area and the Botna Bottoms Wildlife Area. Both WMAs are available for public recreational use, including hunting

for deer, turkey, pheasant, waterfowl, rabbit, and dove, as well as providing river access and public fishing opportunities. One protected area co-managed by the U.S. Army Corps of Engineers and Missouri Department of Conservation (MDC) runs along the Nishnabotna River: the Nishnabotna Conservation Area. This area is managed for a variety of recreational opportunities including bird-watching, fishing, hiking, wildlife viewing, and hunting and trapping. MDC also operates the Watson Access boat ramp which provides access to the Nishnabotna and Missouri Rivers.

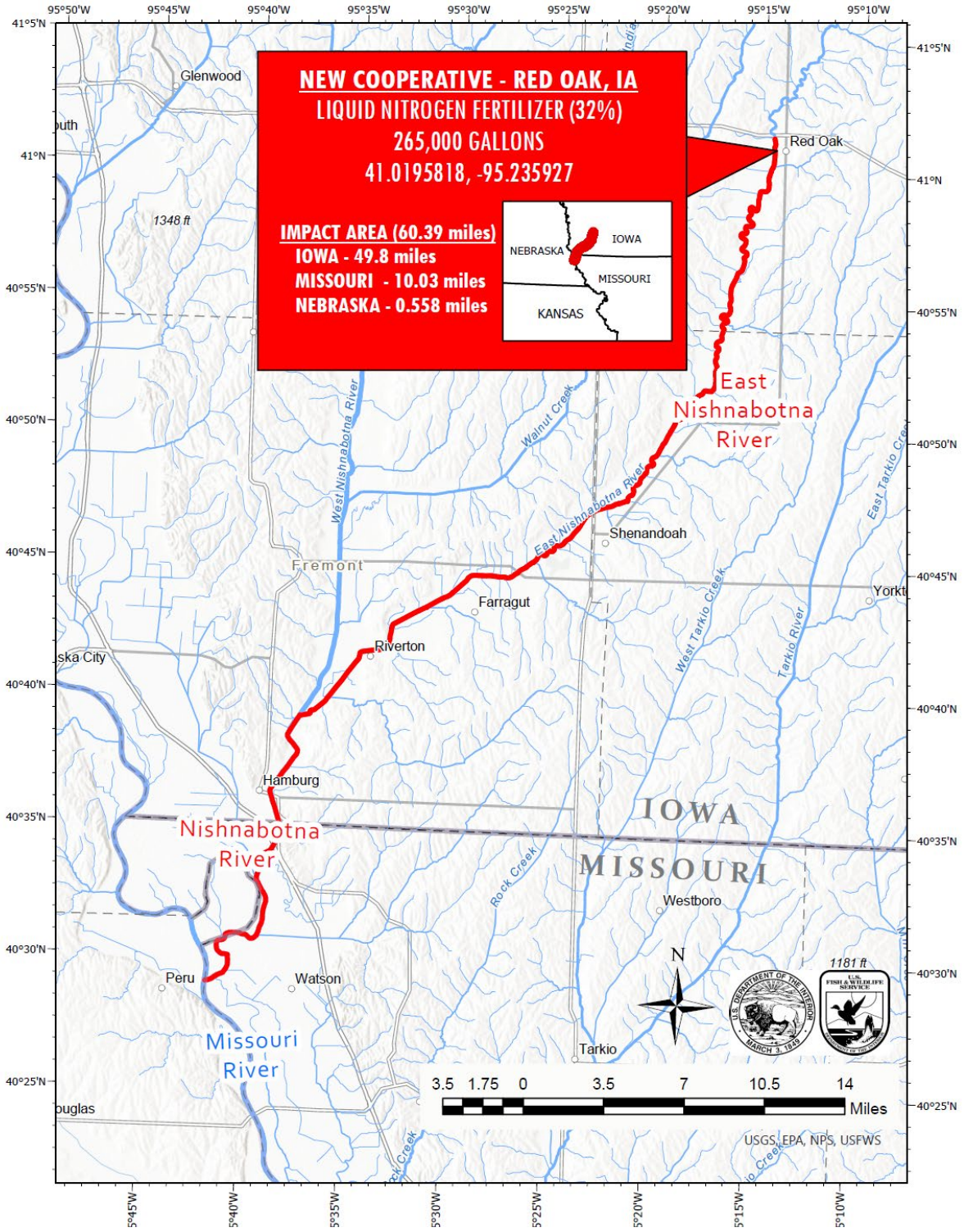

Figure 1. Map of the Nishnabotna Fertilizer Spill impact area, noting the location of the release site in Red Oak, IA, and the 60.39 miles of impacted river across Iowa, Missouri, and Nebraska.

III. Potentially Responsible Party (PRP)

The NEW Cooperative, Inc. (NEW), the largest farmers' co-op in Iowa, began operating in 1973 with 82 operating locations throughout Iowa and Northern Missouri. Services and products provided include crop protection, refined fuels, seed and grain resources, feed, and fertilizers. It is headquartered in Fort Dodge, IA. NEW acquired the Red Oak location in 2023, as part of a merger with United Farmers' Cooperative. The co-op has approximately 12,000 member owners (NEW 2024). NEW operated the Facility from which the March 2024 release of UAN-32 into the East Nishnabotna River in Red Oak, IA occurred. NEW notified IDNR of the release and worked jointly to stop the release.

IV. Damages Excluded from Liability

Pursuant to Section 11.24(b) of the CERCLA Natural Resource Damage Assessment and Restoration (NRDAR) regulations, the Trustees have evaluated the potential for any exclusion or defense to liability under applicable laws. Discharges or releases resulting from the Red Oak facility and the resulting injuries and damages were not within the terms of its permit or license, did not occur wholly before the enactment of CERCLA, and did not result from the application of a pesticide product registered under the Federal Insecticide, Fungicide, and Rodenticide Act, 7 USC 135-135k; or any other federally permitted release, as defined in Section 101(10) of CERCLA; or the release or threatened release of recycled oil from a service station dealer described in Section 107(a)(3) or (4) of CERCLA. The Trustees are unaware of any other exclusion or defense to liability under CERCLA, or other applicable laws.

V. Preliminary Identification of Resources at Risk

The Site supports a wide variety of wildlife, habitats, and recreational opportunities. There are resources and associated services under the trusteeship of federal and state agencies that may have been or were impacted by the Nishnabotna Fertilizer Spill, which include, but are not limited to:

- Federal and state listed freshwater fish species:

Common Name	Scientific Name	Federal Status	State Status
Flathead Chub	*Platygobio gracilis*	-	Endangered (MO)
Lake Sturgeon	*Acipenser fulvescens*	-	Endangered (MO) Threatened (NE)
Pallid Sturgeon	*Scaphirhynchus albus*	Endangered	Endangered (all states)
Shovelnose Sturgeon	*Scaphirhynchus platorynchus*	Threatened Due to Similarity in Appearance	-
Sturgeon Chub	*Macrhybopsis gelida*	-	Endangered (NE)

- Recreational use

VI. Determination

The Site has had a documented release of a hazardous substance, that may have posed a threat to natural resources. The purpose of the PAS is to determine if the release of the hazardous substance poses a significant enough threat to natural resources and the services they provide, to warrant further investigation. The Trustees have evaluated the existing data against the screening criteria in 43 CFR § 11.23 and determined to proceed with a NRDAR.

Criterion 1: *A discharge of oil or a release of a hazardous substance has occurred.*

A release of a hazardous substance from the NEW Cooperative, Inc. facility in Red Oak, IA has occurred. A release of 1,500 tons (265,000 gallons) of liquid nitrogen fertilizer (UAN-32) entered the East Nishnabotna River via a drainage ditch. The fertilizer is a urea ammonium nitrate solution and falls under the category of Ammonia on the Consolidated List of Lists under CERCLA. UAN-32 was measured as both Un-ionized Ammonia and Total Ammonia (TAN) in water samples collected during the response to the release from the NEW facility. Un-ionized Ammonia concentrations exceeded the 1.00 mg/L lethal values for Un-ionized Ammonia throughout the impacted portion of the Nishnabotna River (Francis-Floyd et al. 2012; Noga 1996). Un-ionized Ammonia concentrations in Iowa, exceeded 200 mg/L from the initial point of release and remained elevated downstream 60.39 miles to the confluence of the Missouri River. Concentrations in the Nishnabotna River flowing through Missouri were documented as high as 1.64 mg/L for Un-ionized Ammonia, also exceeding lethal values. From the Total Ammonia data in Missouri, TAN concentrations were calculated and were found to be as high as 47.52 mg/L, exceeding aquatic life and toxicity criteria (EPA 2013). UAN-32 to rapidly spread downstream to the confluence with the Missouri River, thus it is reasonable to assume concentrations of ammonia were higher than these values closer to the point of release.

Criterion 2: *Natural resources for which the Federal or State agency or Indian Tribe may assert trusteeship under CERCLA have been or are likely to have been adversely affected by the discharge or release*.

In accordance with the National Contingency Plan (NCP), 40 CFR §§ 300.600-300.605, and 42 USC 9607(f)(2)(B), MoDNR, IDNR, NDEE, and USFWS on behalf of DOI, have, or share, trusteeship over the natural resources and services[1] identified in Section V, which have or potentially have been injured, lost, or destroyed by the release of a hazardous substance from the NEW facility in Red Oak, IA, as well as response actions. As a result of the release, IDNR recommended that people avoid recreational activities on the Nishnabotna River and not collect or eat dead fish. Preliminary surveys have indicated potential impacts, including species mortality and loss of associated ecological function from exposure to the hazardous substance released. For example, the response documented approximately 800,000 dead fish representing at least 20 different species across the three states. Thus, the Trustees have determined

[1] Services is defined in 43 CFR § 11.14(nn) as the "physical and biological functions performed by the resource including the human uses of those functions. These services are the result of the physical, chemical, or biological quality of the resource."

that natural resources and services for which they have trusteeship have been or likely have been affected by the UAN-32 released during the Nishnabotna Fertilizer Spill.

Criterion 3: *The quantity and concentration of the discharged oil or released hazardous substance is sufficient to potentially cause injury, as that term is used in this part, to those natural resources.*

A total of 1,500 tons (265,000 gallons) of liquid nitrogen fertilizer (UAN-32) was released into the East Nishnabotna River and was transported downstream 60.39 miles and ending near the confluence of the Nishnabotna and Missouri Rivers (Figure 1). Hazardous substance concentrations documented by response water sampling efforts for the Nishnabotna Fertilizer Spill are sufficient to cause injury to natural resources. Fish mortality is evidence of injury under the NRDAR regulations (43 CFR § 11.62 (f)).

Criterion 4: *Data sufficient to pursue an assessment are readily available or likely to be obtained at reasonable cost.*

Data currently exist from the response that will be helpful and cost-effective to use to further assess injury of natural resources. Additional data and information collection may be necessary for injury quantification of some resources, which could be obtained at reasonable cost.

Criterion 5: *Response actions, if any, carried out or planned do not or will not sufficiently remedy the injury to natural resources without further action.*

Response actions, once initiated, stopped additional inputs of UAN-32 into the Nishnabotna River. However, given the nature of the spill there were limited actions available to remove or minimize exposure of aquatic organisms and habitat to UAN-32 (CERCLA § 101(24) and (25)). Natural attenuation is not expected to fully address injured public natural resources or resource services, the Trustees have determined that additional assessment is warranted.

VII. Summary of Determination

Based on the information available, all preassessment screening criteria have been met. Natural resources over which the Trustees may assert trusteeship have been or may have been impacted, and NEW is a viable PRP. Accordingly, the designated trustee agencies, acting on behalf of the public, in accordance with 42 USC § 9607(f) of CERCLA, do find sufficient cause to proceed with an NRDAR of the Nishnabotna Fertilizer Spill.

VIII. References

EPA. (2013). Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater 2013. https://www.epa.gov/sites/default/files/2015-08/documents/aquatic-life-ambient-water-quality-criteria-for-ammonia-freshwater-2013.pdf

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Noga, E.J. (1996). Fish disease: diagnosis and treatment. John Wiley & Sons.

Randall, D.J., & Tsui, T.K.N. (2002). Ammonia toxicity in fish. Marine Pollution Bulletin, Volume 45, Issues 1–12, Pages 17-23. ISSN 0025-326X. https://doi.org/10.1016/S0025-326X(02)00227-8.

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