



NATURAL RESOURCES DEFENSE COUNCIL

May 13, 2013

Colonel Robert J. Ruch, Commander  
U.S. Army Corps of Engineers, Omaha District  
1616 Capitol Ave.  
Omaha, NE 68102-4901

**Re: Surplus Water Agreements for Withdrawals from Lake Sakakawea  
for Oil and Gas Activities**

Dear Colonel Ruch:

On behalf of the more than 1.4 million members and on-line activists of the Natural Resources Defense Council ("NRDC"), we write in opposition to the decision by the U.S. Army Corps of Engineers ("Corps") to sign surplus water agreements authorizing withdrawals from Lake Sakakawea for oil and gas activities in North Dakota. We understand that the Corps has signed one surplus water agreement and that several more are currently pending before the agency.

NRDC believes that current conditions do not justify the release of surplus water. Last fall, drought conditions threatened to halt transport on the Mississippi of goods worth billions of dollars. These drought conditions existed despite record flooding in the summer of 2011. Likewise, drought conditions are likely to threaten navigation again this year despite recent flooding. NRDC members rely on the economic, recreational, ecological and aesthetic values of the Missouri/ Mississippi water system. These values will be harmed by the withdrawals the Corps proposes.

Moreover, the Corps' decision to release "surplus" water at no cost prior to completion of the pending rulemaking to determine appropriate pricing for the water is fiscally irresponsible especially given current federal budget shortfalls.

Neither the fiscal consequences nor the severe effects on navigation experienced last fall were considered at the time the Corps completed its 2011 Surplus Water Supply Report and the accompanying Environmental Assessment. These impacts must be analyzed now *before* the Corps signs agreements conveying the right to "surplus" water or approves intake facilities to withdraw such water.

## **I. The Corps Lacks the Legal Authority to Sign Surplus Water Agreements such as the One Signed with International Western.**

We are in receipt of the surplus water agreement signed by the Department of the Army and the International Western Company (“International Western”) on February 6, 2013. In signing the agreement, the Corps relies upon its authority under Section 6 of the Flood Control Act of 1944<sup>1</sup> to enter agreements for temporary domestic and industrial uses of surplus water. Yet, several recent events call into question whether the water use is either “surplus” or “temporary.”

### **A. No Surplus Exists.**

The Corps itself has acknowledged that releases from the Missouri River system will adversely affect existing lawful uses of the system’s water. In her letter to Senator Richard Durbin (D-IL), Assistant Secretary of the Army Jo-Ellen Darcy concluded that “current drought conditions are likely to require reductions in the volume and duration of the 2013 Missouri River navigation season.” *Letter from Jo-Ellen Darcy to the Honorable Richard J. Durbin* (Dec. 6, 2012) (attached as Exh. 1). Assistant Secretary Darcy also acknowledged the impact on 2013 Mississippi River navigation. *Id.* Given the Corps’ recent refusal to release Missouri River water for existing navigation, the agency cannot justify withdrawals from the system as *surplus* as it did in the agreement it signed with International Western or the other pending surplus water agreements.

Recent rain and destructive flooding are unlikely to change overall drought conditions in the Missouri-Mississippi basin. Drought conditions this year are even worse than they were last year. One year ago, the High Plains had zero percent area in extreme or exceptional drought.<sup>2</sup> Current conditions as reported after April’s rains and flooding include over 32 percent of the High Plains area in extreme or exceptional drought.<sup>3</sup> One year ago, almost 44 percent of the area had no drought.<sup>4</sup> Yet, this year, less than 8 percent area has no drought.<sup>5</sup> While the drought conditions in some areas in the High Plains are predicted to improve somewhat over the next few months, water shortage in the area remains a severe problem.<sup>6</sup>

Even with the recent rains, the current level of the Garrison Reservoir (*ie*, Lake Sakakawea) is measurably below what it was this time last year. The Corps reported end-

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<sup>1</sup> 33 U.S.C. § 708 et seq.

<sup>2</sup> National Drought Mitigation Center, *U.S. Drought Monitor – High Plains* (April 24, 2012 map) (attached as Exh. 2), available at <http://droughtmonitor.unl.edu/archive.html>.

<sup>3</sup> National Drought Mitigation Center, *U.S. Drought Monitor – High Plains* (April 30, 2013 map) (attached as Exh. 3), available at <http://droughtmonitor.unl.edu/archive.html>.

<sup>4</sup> *Id.*

<sup>5</sup> *Id.*

<sup>6</sup> NOAA, *U.S. Seasonal Drought Outlook* (released May 2, 2013) (attached as Exh. 4), available at [http://www.cpc.ncep.noaa.gov/products/expert\\_assessment/season\\_drought.gif](http://www.cpc.ncep.noaa.gov/products/expert_assessment/season_drought.gif).

of-the-month storage level for April this year at 15,422,000 acre-feet.<sup>7</sup> This compares April's end-of-the-month storage last year of 17,586,000 acre-feet – over a twelve percent reduction.<sup>8</sup> Unfortunately, an occasional deluge and accompanying rapid runoff and flow will do little to change the persistent drought conditions the region faces.<sup>9</sup>

## **B. Industrial Use for Oil and Gas Activities in North Dakota is Not Temporary.**

In addition, recent information suggests that the use of water from Lake Sakakawea for oil and gas activities in North Dakota is not *temporary*. Currently, oil and gas companies are drilling between 2,000 and 3,000 new wells per year.<sup>10</sup> The North Dakota Oil and Gas Commission estimates 35,000-40,000 new wells will be drilled and fractured in the area over the next two decades.<sup>11</sup> Each new well requires millions of gallons of water. Producers are looking primarily to the Missouri River for this water.<sup>12</sup>

Based on analysis recently released, drilling in the Bakken may continue to expand and last even longer than previously thought. When the Corps released its *Surplus Water Report* and *Environment Assessment* in 2011, the U.S. Geological Survey (“USGS”) estimated technically recoverable oil resources in the Bakken to be between 3 to 4.5 billion barrels.<sup>13</sup> On April 30, 2013, USGS released an updated report this week doubling their previous estimate. Oil resources in the Bakken are now projected at around 7.4 billion barrels.<sup>14</sup> In the last two years, North Dakota's Department of Mineral Resources has reported an increase in Bakken crude production from 274,000 to 673,000 barrels per day.<sup>15</sup>

The Corps has failed to justify its conclusions that the storage and withdrawal of water from Lake Sakakawea for oil and gas activities is both temporary and surplus. If

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<sup>7</sup> U.S. Army Corps of Engineers, Missouri River Basin Water Management Division, *Monthly Reservoir Summary*, available at <http://www.nwd-mr.usace.army.mil/rcc/reports/showrep.cgi?2PRTPRN1> (Last viewed May 6, 2013).

<sup>8</sup> Available at <http://www.nwd-mr.usace.army.mil/rcc/projdata/garr.pdf>. (Last viewed April 26, 2013).

<sup>9</sup> National Drought Mitigation Center, *U.S. Drought Monitor – High Plains* (comparing time series of percent area from Jan 1, 2000 to April 30, 2013) (attached as Exh. 5).

<sup>10</sup> North Dakota Department of Mineral Resources, *Bakken Basics* (July 19, 2012), available at <https://www.dmr.nd.gov/oilgas/presentations/IowaPetroleumMarketers2012-07-19.pdf>. (Last viewed April 26, 2013).

<sup>11</sup> *Id.*

<sup>12</sup> *Id.*

<sup>13</sup> Pollastro, R.M., Cook, T.A., Roberts, L.N.R., Schenk, C.J., Lewan, M.D., Anna, L.O., Gaswirth, S.B., Lillis, P.G., Klett, T.R., and Charpentier, R.R., 2008, Assessment of undiscovered oil resources in the Devonian-Mississippian Bakken Formation, Williston Basin Province, Montana and North Dakota, 2008: U.S. Geological Survey Fact Sheet 2008–3021, available at <http://pubs.usgs.gov/fs/2008/3021/>.

<sup>14</sup> Gaswirth, S.B., Marra, K.R., Cook, T.A., Charpentier, R.R., Gautier, D.L., Higley, D.K., Klett, T.R., Lewan, M.D., Lillis, P.G., Schenk, C.J., Tennyson, M.E., and Whidden, K.J., 2013, Assessment of undiscovered oil resources in the Bakken and Three Forks Formations, Williston Basin Province, Montana, North Dakota, and South Dakota, 2013: U.S. Geological Survey Fact Sheet 2013–3013, available at <http://pubs.usgs.gov/fs/2013/3013/>.

<sup>15</sup> Available at <http://finance.yahoo.com/news/bakken-oil-field-may-much-211718543.html>. (Last viewed April 26, 2013).

the Corps wishes to reallocate the water from Missouri River projects that the agency operates, it must do so through the process provided under the Water Supply Act.<sup>16</sup> Such reallocation constitutes a major operational change under the Water Supply Act requiring congressional approval.<sup>17</sup>

## **II. The Corps has Failed to Comply with the National Environmental Policy Act.**

NEPA has a dual purpose: it serves to inform decision making and to disclose information to the public about how a federal action will affect the environment and public health.<sup>18</sup> In this case, NEPA's environmental analysis provides a mechanism for evaluating the effect on other uses of the proposed withdrawals for oil and gas activities.

Here, the Corps has failed to comply with NEPA by (A) relying on flawed analysis to justify a finding of no significant impact; and (B) neglecting to adequately address cumulative impacts. Regardless of whether the environmental assessment was sufficient at the time the Corps issued its Surplus Water Report in March 2011, the Corps must supplement this prior analysis to incorporate significant new information before approving surplus water agreements or authorizing new intake facilities.<sup>19</sup>

### **A. The Corps Relied on Flawed Analysis to Justify a Finding of No Significant Impact.**

The Corps has authorized the withdrawal of a tremendous amount of water. The authorized amount of 100,000 acre-feet equals more than 32.5 billion gallons per year. This is almost as much as the 37.9 billion gallons of water used for all irrigation in the state of North Dakota in 2011.<sup>20</sup> Put another way, according to an official with the Energy and Environmental Research Center at the University of North Dakota, the typical annual water use of a Midwestern City of population 50,000 is about 10 million gallons per day (or about 200 gallons per person per day).<sup>21</sup> At that rate, the water withdrawal authorized by the Corps would serve more than 446,000 people each year, or more than 63% of North Dakota's current population.<sup>22</sup> Yet, the Corps found that such withdrawal would have no significant impact.

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<sup>16</sup> 43 U.S.C. § 390b.

<sup>17</sup> 43 U.S.C. § 390b(d); *see also* U.S. Army Corps of Eng'rs, ER 1105-2-100, Planning Guidance Notebook, at 3-33 (2000).

<sup>18</sup> 40 C.F.R. § 1500.1(b), (c).

<sup>19</sup> *Marsh v. Oregon Natural Resources Council*, 490 U.S. 360, 371 (1990). *See also*, 40 C.F.R. § 1502.9(c)(1)(ii).

<sup>20</sup> *See* Amy Dalrymple, *Oil Industry Used 5.4 Billion Gallons of Water in 2012*, The Jamestown Sun (March 18, 2013) (quoting Mike Hove, Water Resource Manager, State Water Commission) available at <http://www.jamestownsun.com/event/article/id/182038/group/News/>.

<sup>21</sup> *See Id.*

<sup>22</sup> *See* Census Bureau, Quickfacts: North Dakota Population, 2012 Estimate available at <http://quickfacts.census.gov/qfd/states/38000.html>.

The Corps improperly based its impact analysis on the conclusion that the difference between the action and no-action alternatives would be an annual depletion of only 527 acre-foot depletion. The Corps' 2011 *Environmental Assessment* evaluates the withdrawal of up to 100,000 acre-feet of water from Lake Sakakawea each year for 10 years. U.S. Army Corps of Engineers, Omaha District, *Garrison Dam/ Lake Sakakawea Project North Dakota Surplus Water Report*, Appendix A Environmental Assessment (March 2011) [hereafter "*Environmental Assessment*"] at 1. Despite authorizing 100,000 acre-feet of water withdrawals each year, the Corps assumed that the proposed action would only result in a net annual depletion of 527 acre-foot and such depletion was not large to have significant associated environmental impacts. *Id.* at 26-27.

The Corps assumes that all but 527 acre-feet of the 100,000 acre-feet a year would be withdrawn from elsewhere on the Missouri if the Corps did not authorize the annual withdrawal from the lake. The agency comes up with this number based on the amount of water currently being withdrawn from groundwater through the temporary conversion of agricultural state water permits to industrial use. *SWR*, at 3-42. The Corps describes this as an "emergency program" for which the need "will no longer exist if surplus water is made available from the Garrison Dam/ Lake Sakakawea Project." *Id.* Other than this 527 acre-feet that the Corps acknowledges will no longer be available, the agency completely sidesteps its responsibility for assessing the consequences of authorizing huge amounts of new water withdrawals.

In defining the "no-action" alternative, the agency assumes that agencies such as the North Dakota State Water Commission will authorize withdrawals from the Missouri upstream of Lake Sakakawea. Yet, the Corps offers no evidence that any applications for such water withdrawals are pending or that the applications would be approved by the State Water Commission. The Corps cannot avoid responsibility for assessing the consequences of its actions by simply assuming that another agency would act if the Corps did not.

## **B. The Corps Neglected to Adequately Address Cumulative Impacts.**

In assessing the environmental impact of entering into surplus water agreements, the Corps must consider the agreements' cumulative impacts. A cumulative impact is defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions."<sup>23</sup> Given the critical competing needs for the Missouri River system's water, the Corps must evaluate the effects of withdrawing 100,000 acre-feet per year for ten years on the reasonably foreseeable competing uses of Lake Sakakawea's water. The agency has failed to do so.

The Corps' erroneous assumption of a net depletion of only 527 acre-feet each year dooms the agency's cumulative analysis as well as its finding of no significant

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<sup>23</sup> C.F.R. § 1508.7.

impact. The Corps cannot simply assume that other agencies will authorize withdrawals elsewhere if the Corps does not authorize the withdrawals from the lake. The Corps assumes that water does exist – and will exist into the future – despite information available now that it might not.

Several problems exist with the Corps analysis of future water supply. The Corps includes no assessment of the likelihood that other existing supplies of water will continue. Instead, the Corps simply assumes that they will. For example, the Corps assumes that 42 existing water depots within the study area will continue to supply the same amount of water each year for the next 10 years. *SWR*, at 3-33. The 38 of these depots that are tapping into groundwater, however, have fixed supplies. The Corps' report includes no evaluation of the size of the affected aquifers or whether the projected rate of withdrawals can be maintained. *SWR*, at 3-33.

In addition, the Corps simply assumes that water is available to meet unused allocations. For example, the Corps compares average actual use each year from 1989-2009 of the five large institutional users holding North Dakota state water permits to their allocated use. The agency concludes that the utilization rate of 29% provides average annual excess capacity of 84,253 acre-feet. *SWR*, at 3-38. The problem is that this excess capacity only exists on paper and not actually in the river system.

Neither the *Surplus Water Report* nor the *Environmental Assessment* contains any analysis of whether water actually exists to supply 100,000 acre feet of demand for which the Corps plans. In fact, the Corps' own actions suggest that the water does not. The region's extreme drought conditions have resulted in restrictions on current levels of existing use. The Corps, for example, has imposed drought conservation measures restricting flow for navigation.<sup>24</sup> The U.S. Department of Agriculture has reported that barge operators on the Missouri River will probably light load barges.<sup>25</sup>

The Corps acknowledges that "the Missouri River Reservoir System is operated in part to meet the needs of downstream navigation interests." *SWR*, at 2-9. Navigation flow is measured at Gavins Point Dam. The level for full-service navigation is set at 35,000 cfs (cubic feet per second). *Id.* Currently, as indicated above, the Corps has reduced this flow to minimum-service which provides for the release of only 29,000 cfs from Gavins Point. *Id.* As a result, shippers are reducing their loads.<sup>26</sup> Given that

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<sup>24</sup> USACE, Northwest Division, News Releases, "*Corps forecast continues to indicate below normal runoff in upper basin*" (May 8, 2013) (According to Jody Farhat, Chief of the Missouri River Water Management Division, "As part of our water conservation measures, we are providing minimum service flow support for navigation for the first half of the navigation season."). Available at <http://www.nwd.usace.army.mil/Media/NewsReleases/tabid/1989/Article/13690/corps-forecast-continues-to-indicate-below-normal-runoff-in-upper-basin.aspx>.

<sup>25</sup> USDA, "*Drought Control Measures Will Limit Missouri River Flows*," *Grain Transportation Report* (March 21, 2013) [hereafter "*Grain Transportation Report*"] available at <http://www.ams.usda.gov/AMSV1.0/getfile?dDocName=STELPRDC5103830&acct=graintransrpt>. While the immediate effect is on the Missouri River, USDA reports that "[i]t is unknown at this point whether restricted flows on the Missouri River will significantly impact water levels on the Mississippi River later in the spring or summer." *Id.*

<sup>26</sup> *Grain Transportation Report* at 1.

existing navigation use is being restricted, the Corps cannot justify its assumption that over 70,000 acre-feet each year of *additional* supply on top of existing uses is available.<sup>27</sup>

Finally, the Corps conducts no analysis of how much – if any – water withdrawn from the Missouri River system returns. In fact, unlike other uses of water, water used by the oil and gas industry is unlikely to return to the water cycle. A large portion of the water that is injected during hydraulic fracturing remains in the underground oil and gas formations. The water that does return to the surface is generally contaminated with both fracking chemicals and substances that occur underground like hydrocarbons and heavy metals, which make it unusable for most other purposes.<sup>28</sup> This “flowback water” is sometimes treated and reused, but eventually it must be disposed of, usually by injection deep underground.<sup>29</sup> Thus, this water is likely lost forever. In contrast, water used for domestic purposes, agriculture, and most businesses, is eventually returned to the environment.

### **III. The Corps Cannot Authorize Intake Facilities without Additional Work to Protect Endangered Species and Cultural Resources.**

The Corps has failed to take the actions necessary to comply with Endangered Species Act and the National Historic Preservation Act before authorizing new construction of intake facilities for the withdrawal of water from Lake Sakakawea. The Corps acknowledges that the agency must issue a regulatory permit and easement prior to construction of any intake facilities. SWR, at 2-17. While the Corps conducted an initial analysis of potential impacts on endangered species and cultural resources in its 2011 *Environmental Assessment*, the agency itself admits that additional analysis is needed. EA at 29 (“The sole purpose of the map [identifying possible difficulty and delays in obtaining permits] was to provide a “first cut” level of guidance for potential water users who were considering locations to propose an intake. Cultural, historical, park and recreation, and fish and wildlife resources are not differentiated on the map.”).

Even according to this preliminary map, the potential for conflict with endangered species and cultural resources may be significant. Of the seven proposed intake sites, one is located in an area identified as “high” difficulty of placement based on resource concerns and at least four proposed sites are located in an area identified as “moderate” difficulty of intake placement. EA at 30 (Figure 4) (attached as Exh. 6). The entire

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<sup>27</sup> This amount represents the approximate supply from “free-flowing reaches of Missouri River” under no action (70,123) or “from GD/LS surplus water” under proposed action (70,650). See SWR, at 3-43.

<sup>28</sup> See Stepan et al, University of North Dakota Energy & Environmental Research Center, *Bakken Water Opportunities Assessment – Phase I* 10, 13-14 (2010) EERC-04-03, available at <http://www.undeerc.org/bakken/pdfs/FracWaterPhaseIreport.pdf>.

<sup>29</sup> See American Petroleum Institute, *Overview of Exploration and Production Waste Volumes and Waste Management Practices In the United States* 2 (2000) available at [http://www.api.org/environment-health-and-safety/environmental-performance/~media/Files/EHS/Environmental\\_Performance/ICF-Waste-Survey-of-EandP-Wastes-2000.ashx](http://www.api.org/environment-health-and-safety/environmental-performance/~media/Files/EHS/Environmental_Performance/ICF-Waste-Survey-of-EandP-Wastes-2000.ashx); see also Clark, C.E., and J.A. Veil, *Produced Water Volumes and Management Practices in the United States* 23 (2009) ANL/EVS/R-09/1, Argonne National Laboratory, (finding that greater than 95% of produced water is disposed of by underground injection) available at <http://www.netl.doe.gov/technologies/coalpower/ewr/water/pdfs/anl%20produced%20water%20volumes%20sep09.pdf>.



shoreline of the lake, for example, is designated as critical habitat for the piping plover. Road and pump facility construction and underground drilling could adversely affect this habitat. The diverse habitat provided by Lake Sakakawea is home to several other listed species including pallid sturgeon, shovelnose sturgeon, black-footed ferret, gray wolf, interior least tern and the whooping crane. Drains placed in the lake for water withdrawal could adversely affect sturgeon as fish are often killed when they are sucked into the screens placed over the drains.

Given the potential conflict with endangered species and cultural resources, the Corps cannot meet its legal obligations under the Endangered Species Act and the National Historic Preservation Act without further consultation and review. To date, the Corps appears to be relying on the prior incomplete analysis in the Surplus Water Report and its accompanying environmental assessment. The Corps, for example, approved the application of International Western to construct intake facilities at the Thompson site in January 2013.<sup>30</sup> In documenting compliance with the Endangered Species Act and the National Historic Preservation Act, the Corps simply referred to the Surplus Water Report rather than conducting any new analysis. As the Corps itself acknowledged, this prior analysis did not complete the job required.

## CONCLUSION

In conclusion, we urge the Corps to deny the pending applications it has for surplus water withdrawals from Lake Sakakawea. The Corps has failed to justify that the proposed use for oil and gas activities is temporary or that surplus supply exists. The use of the lake's water may in fact be appropriate, but this is a decision that should only be made after Congressional review and reallocation that balances other competing uses such as for drinking water, agriculture and navigation. Moreover, such withdrawals should not be made until the appropriate price of the water is determined.

Sincerely,



Sharon Buccino  
Senior Attorney  
Director, Land and Wildlife Program

Amanda Jahshan  
Legal Fellow

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<sup>30</sup> USACE, North Dakota Regulatory Office, *Memorandum for Record*, Regulatory Permit No. NOW-2012-2209BIS (Jan. 9, 2013) at 2.



Cc: Joel R. Cross, Colonel, U.S. Army, District Engineer, NWO  
Christopher D Wiehl, NWO  
Thomas Morrissey, NWO, Office of Counsel  
Daniel E. Cimarosti, NWO, North Dakota Regulatory Office

## LIST OF EXHIBITS

- Exhibit 1      *Letter from Jo-Ellen Darcy to the Honorable Richard J. Durbin* (Dec. 6, 2012)
- Exhibit 2      National Drought Mitigation Center, *U.S. Drought Monitor – High Plains* (April 24, 2012 map)
- Exhibit 3      National Drought Mitigation Center, *U.S. Drought Monitor – High Plains* (April 30, 2013 map)
- Exhibit 4      NOAA, *U.S. Seasonal Drought Outlook* (released May 2, 2013)
- Exhibit 5      National Drought Mitigation Center, *U.S. Drought Monitor – High Plains* (comparing time series of percent area from Jan 1, 2000 to April 30, 2013)
- Exhibit 6      U.S. Army Corps of Engineers, Omaha District, *Garrison Dam/ Lake Sakakawea Project North Dakota Surplus Water Report*, Appendix A Environmental Assessment (March 2011), Figure 4, at 30.

# **Exhibit 1**



DEPARTMENT OF THE ARMY  
OFFICE OF THE ASSISTANT SECRETARY  
CIVIL WORKS  
108 ARMY PENTAGON  
WASHINGTON DC 20310-0108

DEC - 6 2012

Honorable Richard J. Durbin  
United States Senate  
711 Senate Hart Office Building  
Washington, D.C. 20510

Dear Senator Durbin:

This is in response to your November 29, 2012 letter, co-signed with nine other Senators, requesting an analysis of the impact of additional Missouri River releases to sustain navigation traffic on the Mississippi River. I am providing an identical response to each of the signers of your letter.

As we discussed in our November 29 meeting, in accordance with the Missouri River Mainstem Reservoir System's statutory authorization and as required by the Missouri River Mainstem Reservoir System Master Water Control Manual, the Army Corps of Engineers (Corps) operates the system for its multiple Congressionally-authorized purposes within the Missouri River basin. The Corps lacks authority to alter the authorized purposes of the Missouri River Mainstem Reservoir System or to modify operation of the system under the water control manual for the express purpose of benefiting Mississippi River navigation. However, in response to your request, the Corps performed a historical event review and a qualitative analysis of the likely effects of greater releases from the Missouri River Mainstem Reservoir System into the Mississippi River. The Corps has identified the potential for significant negative effects on the Missouri River system. If the drought persists, these are the likely negative effects on project purposes, based on past experience from the 2000 to 2007 drought:

- a) Additional releases on the Missouri River would further deplete storage in the reservoir system, which currently is forecast to begin the 2013 runoff season 20% below the storage level specified by the reservoir system's 12-year drought plan. Based on current estimates for below average rainfall, releasing water for navigation for the Mississippi River would increase the 12-year drought storage shortfall by another 5% after just one year of drought. More significantly, any such Missouri River releases are insufficient to maintain navigation on the Middle Mississippi River without additional rainfall.
- b) The water control manual identifies variable water release volumes, as well as the duration of the navigation season, depending on reservoir levels. Current drought conditions are likely to require reductions in the volume and duration of the 2013 Missouri River navigation season. In the absence of significant additional rainfall, additional water withdrawals in support of Mississippi River navigation in the December 2012 to April 2013 period would not only shorten the 2013 Missouri River navigation season but also negatively affect 2013 Mississippi River navigation.
- c) Hydropower production on the Missouri River Mainstem Reservoir System relies on the system's planned water releases. Lower reservoir levels and lower water releases would reduce production, leading to higher rates paid by customers that would continue for a period even after the drought ended.

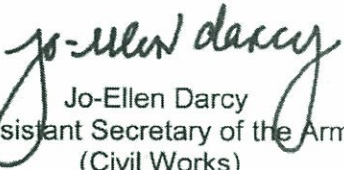


- d) Water supply and water quality are negatively affected by low reservoir levels. Lowered water levels would cause water intakes located at and below the Missouri River reservoirs to be unable to reach the water. These intakes also provide drinking water for several federally-recognized Tribal communities. During the last 2000-2007 drought, the Standing Rock Sioux Tribe lost access to water for several days when the lake levels became lower than their intake. Other intakes had to be relocated at Federal expense.
- e) Irrigation costs would be expected to increase through greater pumping costs and the need to dredge pumping sites. During the last drought, some farmers were forced to abandon irrigation efforts and forego a production of a crop until reservoir levels recovered.
- f) Fish and wildlife would be affected by low water through the direct loss of habitat and a reduction in the quality of habitat.
- g) Recreation and resulting local economic benefits would decline if there is a loss of access to boat ramps and marinas. Millions of dollars were spent by users during the last drought extending and relocating boat ramps and marinas. Some small businesses associated with recreation were forced to close.
- h) While flood risk reduction may be enhanced through increased storage capacity caused by reservoir releases, this is negated significantly in winter months by an increased likelihood of flooding caused by ice-jams obstructing the channel.
- i) Lower reservoir levels can also expose cultural resources, risking damage to them. Two federally-recognized Tribes have already requested formal consultation regarding this issue because of declining reservoir levels due to the drought.

As a further update from our November 29 discussion, the Corps has proceeded with an expedited contract advertisement and award process to remove rock pinnacles from the Mississippi River. The Corps held an on-site meeting with perspective contractors on December 4<sup>th</sup> and expects that the contractors will begin removing rock as early as possible in December. The Corps also has begun mobilizing dredges to remove approximately 21 sediment shoals in the Middle Mississippi River. The rain now being forecast by the National Weather Service could reduce the rate of decline in Mississippi River stages through the mid- to late-December period. Based on that rain forecast and the combination of rock pinnacle removal, dredging, Upper Mississippi River releases, and the limited Missouri River flows currently authorized are expected to be sufficient to sustain navigation on the middle Mississippi River without additional releases from the Missouri River Mainstem Reservoir System.

I assure you that the Corps continues to undertake all measures within its authority and available resources that are necessary to maintain navigation on the Mississippi River during these drought conditions.

Very truly yours,

  
Jo-Ellen Darcy  
Assistant Secretary of the Army  
(Civil Works)

# Exhibit 2



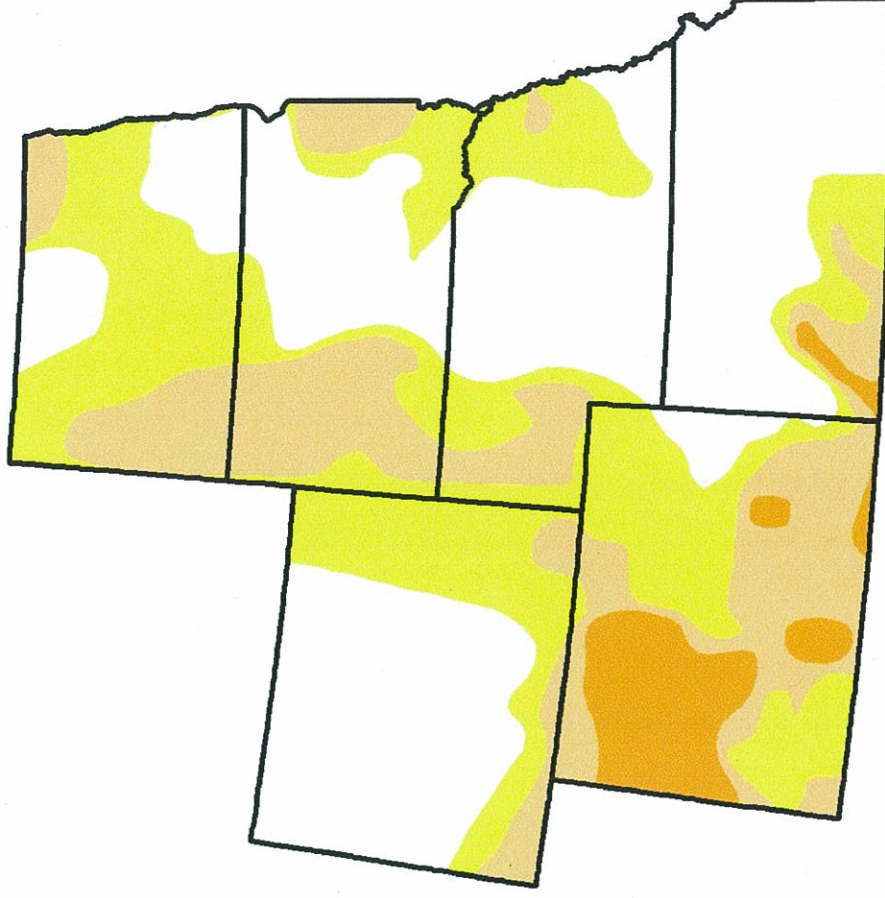
# U.S. Drought Monitor

## High Plains

April 24, 2012  
Valid 7 a.m. EST

Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4 D4
Current	43.85	56.15	25.85	5.70	0.00 0.00
Last Week (04/17/2012 map)	42.66	57.34	24.30	5.68	0.00 0.00
3 Months Ago (01/24/2012 map)	40.03	59.97	22.86	6.33	2.22 0.04
Start of Calendar Year (12/27/2011 map)	61.66	38.34	18.12	7.22	2.07 0.04
Start of Water Year (09/27/2011 map)	70.09	29.91	17.44	11.97	6.22 2.96
One Year Ago (04/19/2011 map)	64.55	35.45	18.54	11.20	0.42 0.00

### Intensity:



The Drought Monitor focuses on broad-scale conditions.  
Local conditions may vary. See accompanying text summary  
for forecast statements.



Released Thursday, April 26, 2012  
Anthony Artusa, Climate Prediction Center/NCEP/NWS/NOAA

<http://droughtmonitor.unl.edu>



# **Exhibit 3**

# U.S. Drought Monitor

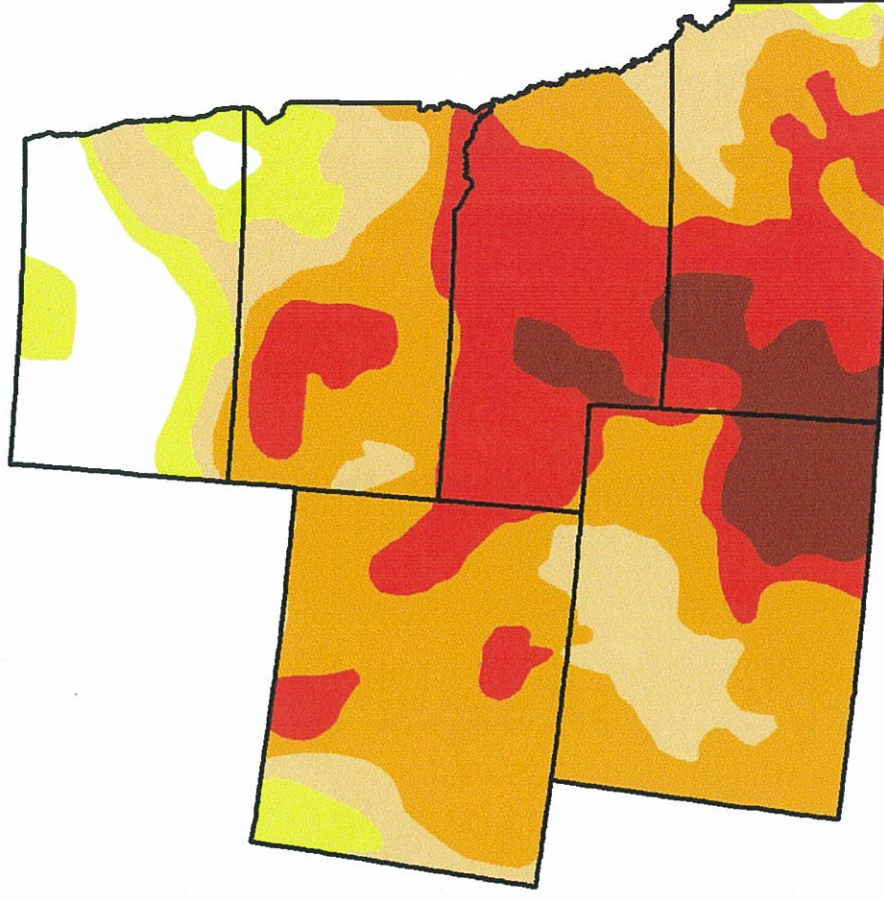
## High Plains

April 30, 2013  
Valid 7 a.m. EST

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	7.72	92.28	85.04	69.52	32.53	8.00
Last Week (04/23/2013 map)	7.07	92.93	86.14	69.80	37.82	7.32
3 Months Ago (01/29/2013 map)	4.79	95.21	92.08	87.25	61.29	27.02
Start of Calendar Year (01/01/2013 map)	1.54	98.46	93.01	86.20	60.25	26.99
Start of Water Year (09/25/2012 map)	0.00	100.00	98.91	83.80	61.28	24.35
One Year Ago (04/24/2012 map)	43.85	56.15	25.85	5.70	0.00	0.00

### Intensity:



The Drought Monitor focuses on broad-scale conditions.  
Local conditions may vary. See accompanying text summary  
for forecast statements.

<http://droughtmonitor.unl.edu>



Released Thursday, May 2, 2013  
Eric Luebehusen, U.S. Department of Agriculture

# **Exhibit 4**

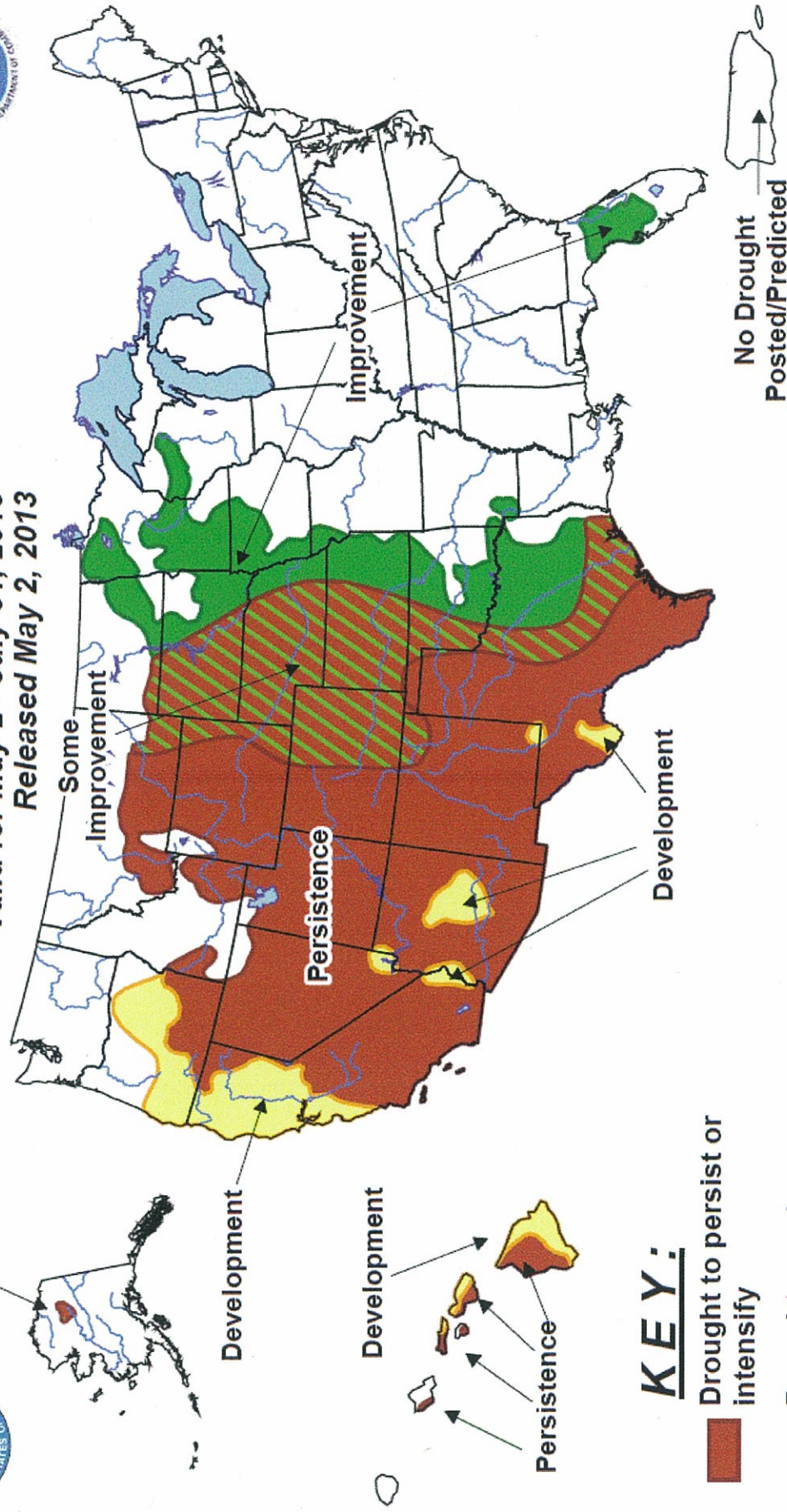




# U.S. Seasonal Drought Outlook

## Drought Tendency During the Valid Period

Valid for May 2 - July 31, 2013  
Released May 2, 2013



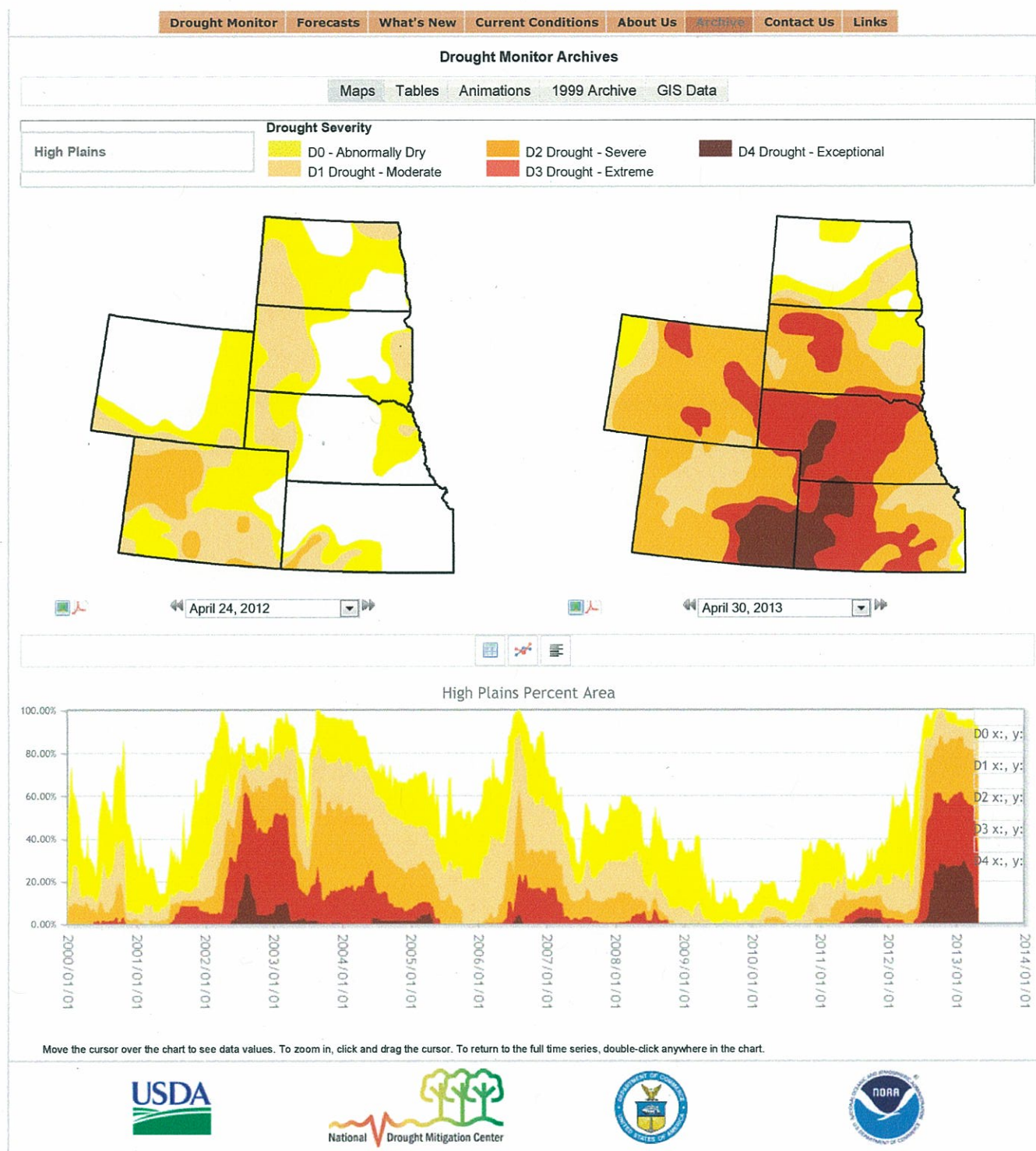
### KEY:

- Drought to persist or intensify
- Drought ongoing, some improvement
- Drought likely to improve, impacts ease
- Drought development likely

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor. NOTE: the green improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.

# **Exhibit 5**





# **Exhibit 6**



**Figure 4**  
**Coordination Index – Difficulty of Placing an Intake**

