
REPUBLICAN RIVER COMPACT ARBITRATION

**Pursuant to Section VII,
Final Settlement Stipulation
(December 15, 2002)**



N-CORPE AUGMENTATION PLAN



BEFORE MR. JEFFREY C. FEREDAY, ARBITRATOR



**DIRECT TESTIMONY OF THOMAS E. RILEY, RE:
N-CORPE AUGMENTATION PROJECT**



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1 **1. Q: Please state your name for the record.**

2 A: I, Thomas E. Riley, P.E., hereby offer the following as my Direct Testimony in this
3 matter.

4 **2. Q: What is the purpose of your Direct Testimony?**

5 A: The purpose of my Direct Testimony is to provide expert and factual background
6 related to the development and operation of the N-CORPE Augmentation Project
7 (“N-CORPE Project”). A copy of my expert report, disclosed on February 7, 2014 in
8 accordance with the Time Frame Designation, is Exhibit N30011. I hereby incorporate
9 that discussion as part of my Direct Testimony.

10 **3. Q: Is this the first time you have offered testimony in a legal proceeding?**

11 A: No. I have testified numerous times as both an expert and a fact witness. I was among
12 a team of Nebraska witnesses that appeared before Special Master William J. Kayatta,
13 now sitting on the First Circuit Court of Appeals. He presided over the recent *Kansas v.*
14 *Nebraska*, No. 126 Orig., litigation. I also testified in the Rock Creek Arbitration last
15 summer before Arbitrator Jeffrey C. Fereday. The physical characteristics and setting of
16 Medicine Creek, as well as the N-CORPE Project elements, are analogous to those in the
17 Rock Creek Arbitration. Many of my observations here are, therefore, consistent with my
18 prior testimony in the Rock Creek Arbitration.

19 **EDUCATIONAL AND PROFESSIONAL BACKGROUND**

20 **4. Q: Please describe your professional and educational background.**

21 A: I have practiced as a research or water resources and environmental engineer for over
22 20 years. I am presently serving as the President of The Flatwater Group, Inc. (“TFG”) a
23 water resources and environmental engineering firm I founded in 2000. I received a B.S.
24 in Civil Engineering from the University of Nebraska in 1986 and a M.S. in Civil

1 Engineering from the same institution in 1988. I am presently working on acquiring my
2 Ph.D. in engineering. I am a licensed professional engineer in the states of Nebraska,
3 Missouri, Kansas, and South Dakota. A true and accurate copy of my latest curriculum
4 vitae is found at Exhibit N30011.

5 **5. Q: Please explain your familiarity with the Medicine Creek subbasin in**
6 **south central Nebraska.**

7 A: I have extensive personal and professional experience in the Medicine Creek
8 subbasin. While I have often recreated in the watershed, enjoying both fishing and
9 camping around Harry Strunk Lake, I have also had the opportunity to work
10 professionally in the watershed over 13 years in support of Nebraska's Republican River
11 Compact activities. For the last 15 months I have been supporting design and
12 construction of the N-CORPE Project. I should note for the record that N-CORPE is an
13 interlocal agency consisting of four member natural resource districts (NRDs). The Upper
14 Republican (URNRD), Middle Republican (MRNRD), Lower Republican (LRNRD), and
15 Twin Platte (TWNRD) NRDs comprise the membership of N-CORPE. While not the
16 design engineer of record, I was consulted by the N-CORPE board and the design
17 engineers, Miller & Associates, Consulting Engineers, P.C. and HDR, Inc. throughout
18 development and construction.

19 **6. Q: How valuable was your experience in the Medicine Creek watershed in**
20 **developing your views on the N-CORPE Project?**

21 A: Invaluable. I try to personally review and observe all the projects on which I work. I
22 don't believe you can really understand a project fully without putting boots on the
23 ground. Mere review of data and model results just don't tell the whole story. This is
24 particularly true of Medicine Creek, as explained in my expert report. At Medicine Creek,

1 my visits occurred at different times of the year, providing me a temporal understanding
2 about the Medicine Creek baseflow, runoff responses, and watershed infrastructure. This
3 background knowledge allowed me to share my experience with other members of the
4 Nebraska team, for example Dr. Schneider and others.

5 **7. Q: Please describe generally the work you performed relevant to this**
6 **proceeding.**

7 A: I assisted the URNRD and, more generally, the Republican River NRDs in examining
8 the site selection and feasibility of stream augmentation projects. Like the Rock Creek
9 Augmentation Project, the N-CORPE Project has its roots in studies initiated in 2006
10 using funding provided through Nebraska's Interrelated Water Management Plan
11 Program. When land in the Medicine Creek Watershed became available for purchase in
12 late 2012, I assisted the NRDs I mentioned above and later the N-CORPE Board of
13 Directors, in evaluating the development of an augmentation project for those lands. The
14 N-CORPE Board of Directors retained Miller & Associates, Consulting Engineers, P.C.
15 and HDR Engineering, Inc. to design and oversee the construction of the plant and
16 equipment for the N-CORPE Project.

17 **8. Q: Please describe the nature of Medicine Creek.**

18 A: Medicine Creek is similar to Rock Creek in material respects. It is a baseflow
19 dominated stream that gains streamflow from near the outlet of the N-CORPE Project to
20 the U.S. Geological Survey gaging station 06842500 located below Harry Strunk
21 Reservoir, Nebraska. In my experience and review of the hydrologic record, as well as
22 other literature, it appears to me there are minimal if any losses from this stream, just like
23 Rock Creek. A review of the gaging station information along the length of Medicine

1 Creek to its confluence with the mainstem of the Republican River supports this
2 assessment. I included some of this information in my expert report, N30011 (Table 1).

3 **9. Q: Are there any particular features of the two project areas that strike you**
4 **as similar?**

5 A: Absolutely. Although the scale of the N-CORPE Project is larger, I find it interesting
6 that the length of stream from the discharge point to the commencement of perennial flow
7 is nearly the same (on the order of a few miles). Thus, I expect the N-CORPE Project to
8 behave in a manner similar to the Rock Creek Project once discharges reach full capacity.
9 In fact, given what I know about the depth to groundwater in this reach, I expect minimal
10 if any losses of N-CORPE Project water when it is fully operational.

11 **10. Q: What have you observed about groundwater levels in that area?**

12 A: Groundwater discharges into Medicine Creek in this area creating the headwaters of
13 the creek. In fact, dewatering of groundwater was required for the pipeline installation
14 just about 1,000 feet above the N-CORPE Project discharge point. I observed the
15 discharge from dewatering operations migrating downstream and flowing into the
16 Medicine Creek channel downstream of the Project discharge. With the dewatering
17 discharge at only about 200 gallons per minute, it is a good sign that Project discharges
18 will move effectively down the stream channel. When the N-CORPE Project is fully
19 operational, it will discharge about *185 times* that amount.

20 **11. Is that all?**

21 A: No. We experienced difficulties replacing undersized culverts at road crossings
22 downstream of the Project discharge point. As a result of hydrostatic pressure driving
23 groundwater to the surface in this area the new culverts started to sink when they filled
24 with water. You might think of it as “quicksand” where basically the soil in the

1 streambed losses its ability to support weight because the upward flowing groundwater
2 discharging into the stream suspends the soil particles. This presented a challenge and a
3 modification of the culvert installation method.

4 **12. Q: Please describe generally the N-CORPE Project.**

5 A: It is basically just like the Rock Creek Project, except bigger: More retired irrigation,
6 more pumping wells, more discharge. The Project's plant and equipment generally
7 includes groundwater pumping wells, a buried pipe conveyance system that transports
8 water to the outlet, and control and management appurtenances. The facility has the
9 capacity to pump 60,000 acre-feet per year (or about three times the amount being run
10 through Rock Creek). The water will discharge to Medicine Creek about 2 to 3 miles
11 above the point at which Medicine Creek has perennial flow.

12 **13. Q: Please elaborate on the N-CORPE Project's components and its effect on**
13 **Medicine Creek and the Republican River.**

14 A: I believe the best way to evaluate the N-CORPE Project is through a visual overview.
15 As I did in the Rock Creek Arbitration, I have developed a narrated video (N30012) that
16 provides an overview of the N-CORPE Project and the Medicine Creek watershed. At my
17 direction, and with my review, Mr. David Kracman of TFG created the presentation using
18 video and photographs I have collected since the N-CORPE Project was initiated. This
19 information is coupled with aerial photos and Google Earth imagery. The purpose of the
20 video is to present the Project components and the discharge receiving stream, Medicine
21 Creek. For convenience, I have included the narrative of the video as part of my
22 testimony in this instance. *See* Exhibit N30013.

1 **14. Q: To the best of your knowledge, do N30012 and N30013 represent a true**
2 **and accurate portrayal of the Project and its interaction with Medicine**
3 **Creek and the Republican River?**

4 A: Yes.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 24th day of February, 2014.



Thomas E. Riley, P.E.

N-CORPE AUGMENTATION PLAN

CERTIFICATE OF SERVICE

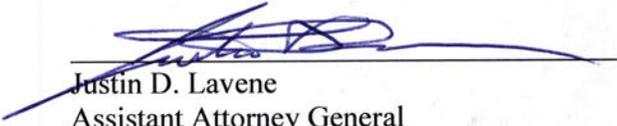
I, Justin D. Lavene, Assistant Attorney General for the State of Nebraska in the above-captioned matter, hereby certify that on February 24, 2014, I made service of the **DIRECT TESTIMONY OF THOMAS E. RILEY, RE: N-CORPE AUGMENTATION PROJECT**, by causing a paper copy and an electronic copy to be delivered by UPS Overnight Mail and/or electronic mail pursuant to Section E of the Arbitration Agreement and Paragraph 8 of the Arbitrator's Pre-Hearing Order on the following:

Jeffrey C. Fereday, Arbitrator

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