Robert Longenbaugh
Testimony Before House Ag Committee
CO House Bill 12-1278
Monday, February 20, 2012

- There have been significant changes in water administration in the South Platte Basin since 2001. These changes have resulted in significant hydrologic consequences.

- GASP and CCWCD operated under SEO approved substitute supply plans from 1972-2001. Amount of water needed to prevent priority call was only 5-10% of irrigation well consumptive use.

- Current court augmentation decrees require irrigation wells to replace 100% of their consumptive use.

- Ground water levels between Denver and Julesburg are at an all time recorded high except near Wiggins.

- Those high ground water levels have caused flooded basements, drainage problems in agricultural fields, failure of infrastructure, increased nonbeneficial consumptive use by phreatophytes, and significant flow to Nebraska above that needed to comply with the compact.

- The increase in South Platte River flows I believe are due to curtailment of well pumping and excess augmentation. These increased river flows are supplying water for artificial recharge which is causing the high water tables and excess flows to Nebraska.

- We must take immediate action now to lower the ground water levels that are causing injury to homes and damage to irrigation fields.

- We must also do the necessary studies so you the legislators can consider needed legislative changes to allow the State Engineer to manage and administer both the ground and surface water to achieve maximum beneficial use as required in the 1969 Ground Water Administration Act.

2/20/12

Statement Of

John C. Halepaska, PH.D., P.E.

1) The period from 1969 to the drought of 2001 was a successful period of conjunctive use in the South Platte River Basin.

2) The Conjunctive use concept failed during the drought due to the lack of agreement regarding the use of the 10,000,000 Acre-ft of water stored in the ground water.

3) Due to court cases and legislation, strict administration has been in effect since 2006 resulting in a dramatic upset in the South Platte River Aquifer water balance.

4) This dramatic upset in the water balance has resulted in record high ground water levels and large non-beneficial outflows of water to Nebraska.

5) Record high ground water levels are primarily due to recharge projects and 100% augmentation for the 8000 wells.

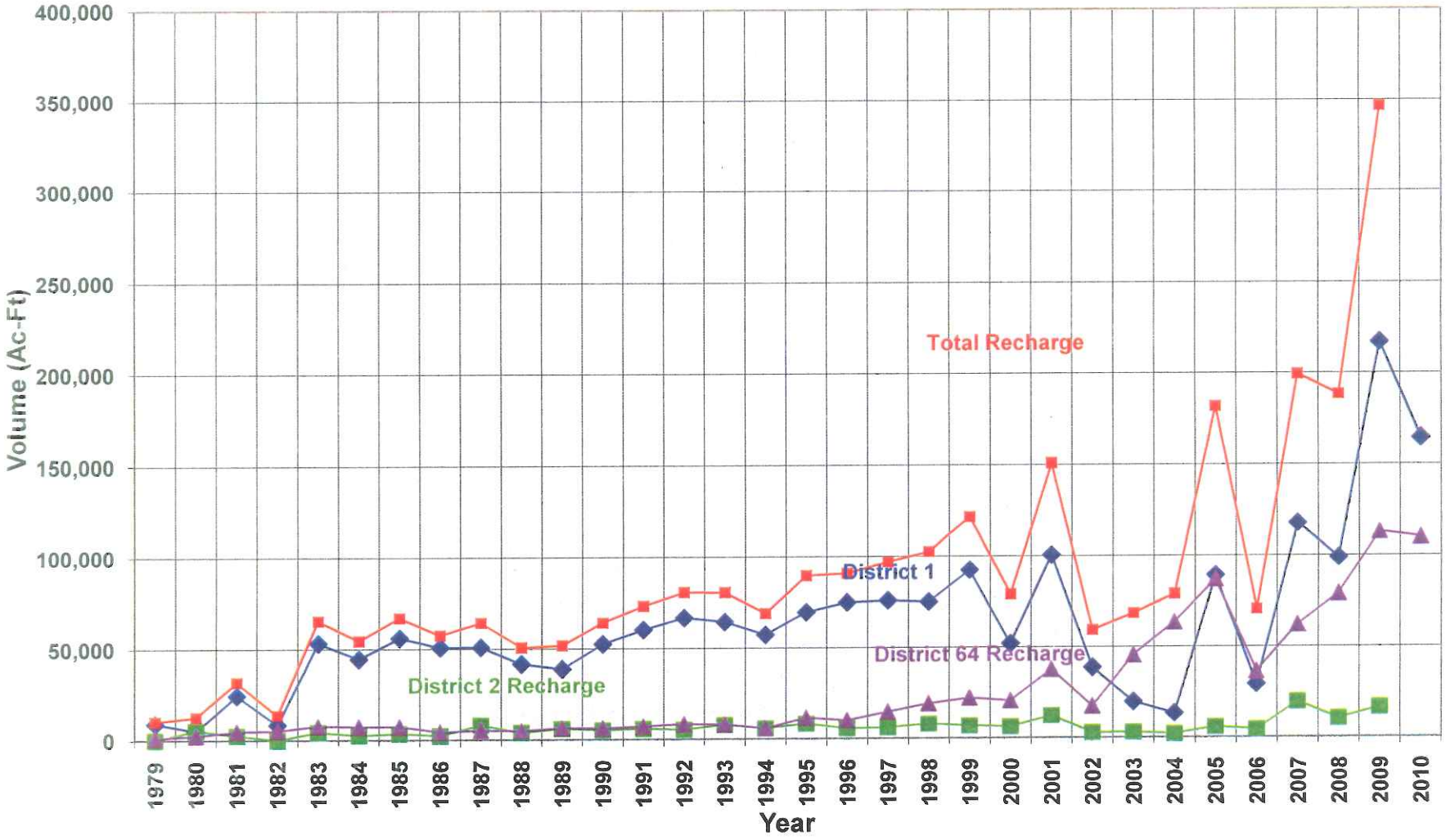
6) Record high ground water levels have caused water logged property, including fields and homes, record high non-beneficial evapo-transpiration , and large non-beneficial outflows to Nebraska.

7) Strict administration of the 8000 wells as measured by the report card of maximizing beneficial use was a management blunder by Colorado Courts and agencies resulting in Huge unearned Water rewards for Nebraska irrigators.

8) Colorado's inability to conjunctively manage their water resources in the South Platte basin has resulted in a billion dollar windfall to Nebraska at Colorado's expense.

Conjunctive use management guided by REAL TIME surface and ground water data could result in maximizing beneficial use conjunctively and minimizing injury. Minimizing injury non-conjunctively maximizes non-beneficial use.

South Platte Recharge



Source: Colorado Division of Water Resources

Figure 10-6
Julesburg Gauge Water Year 2010 Discharge

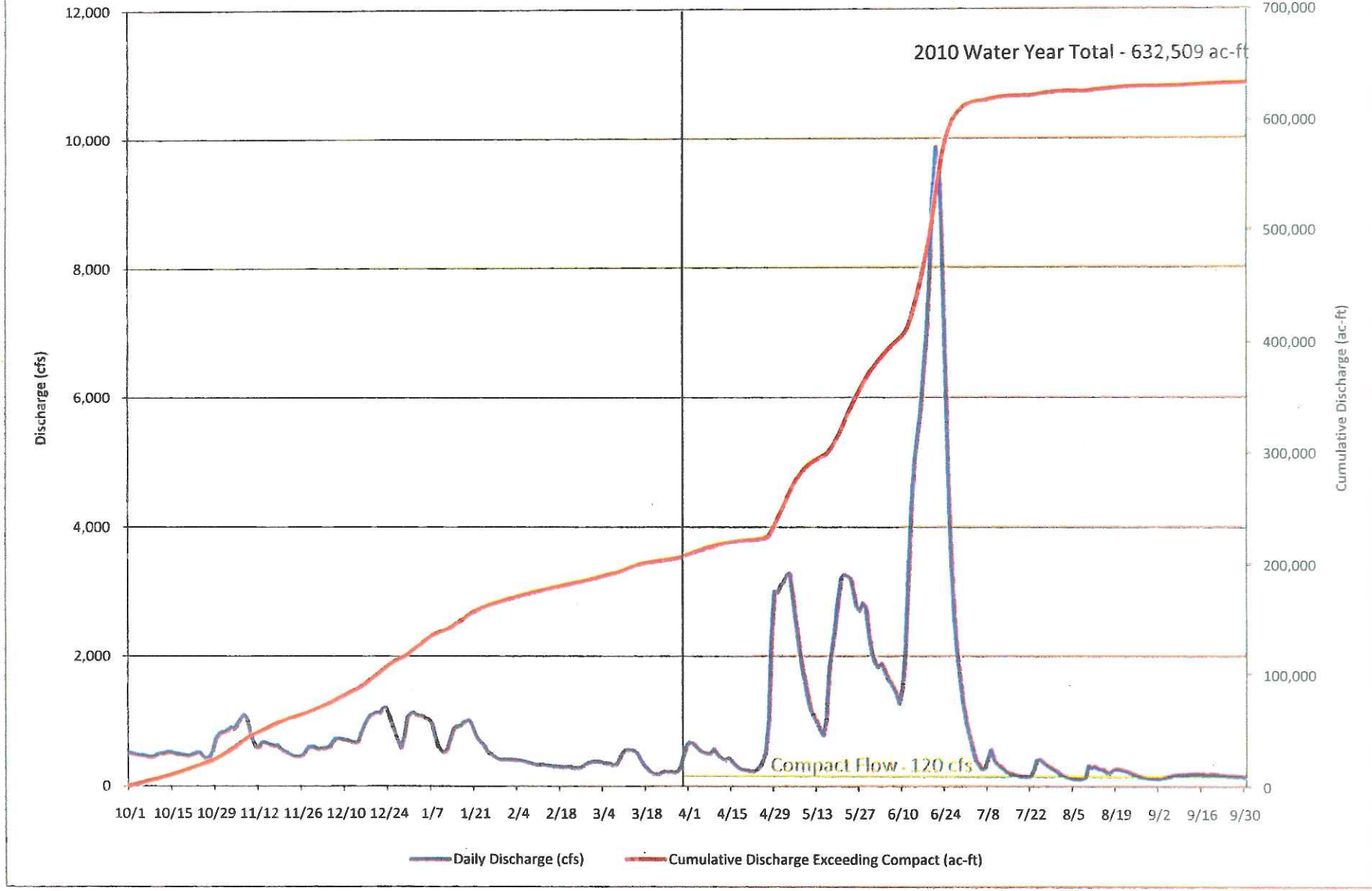
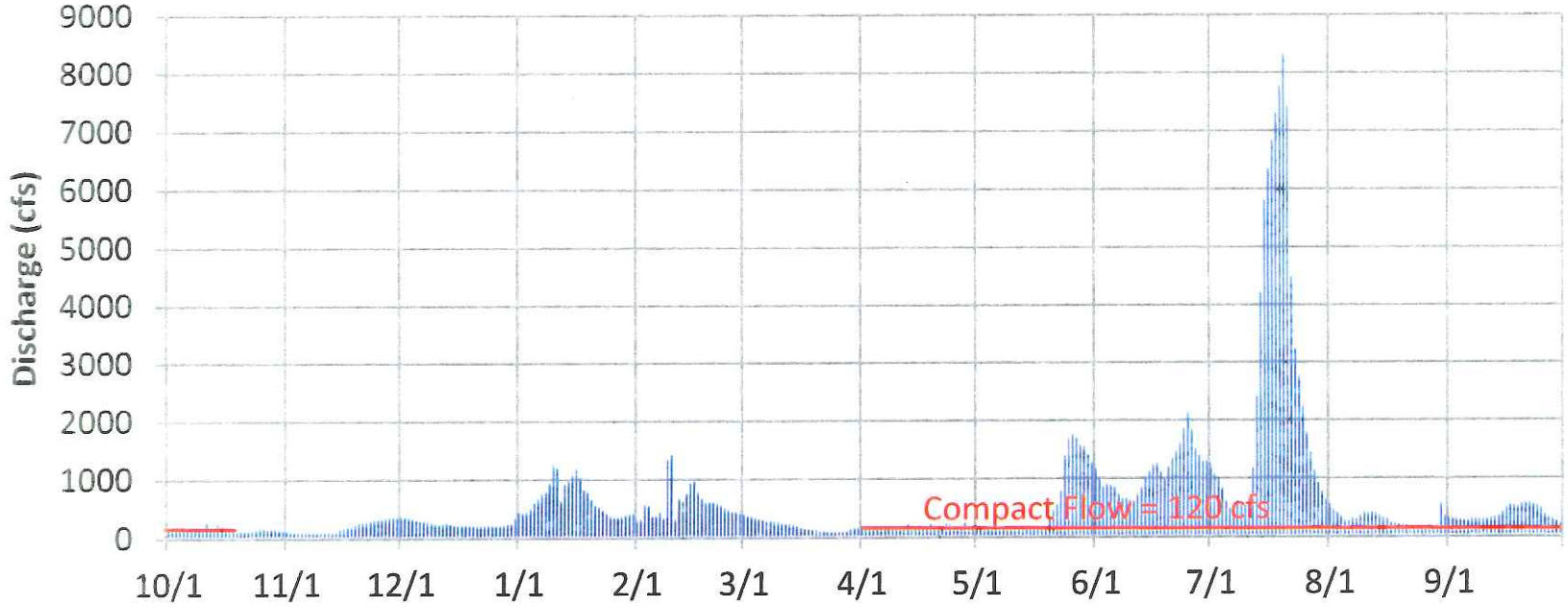
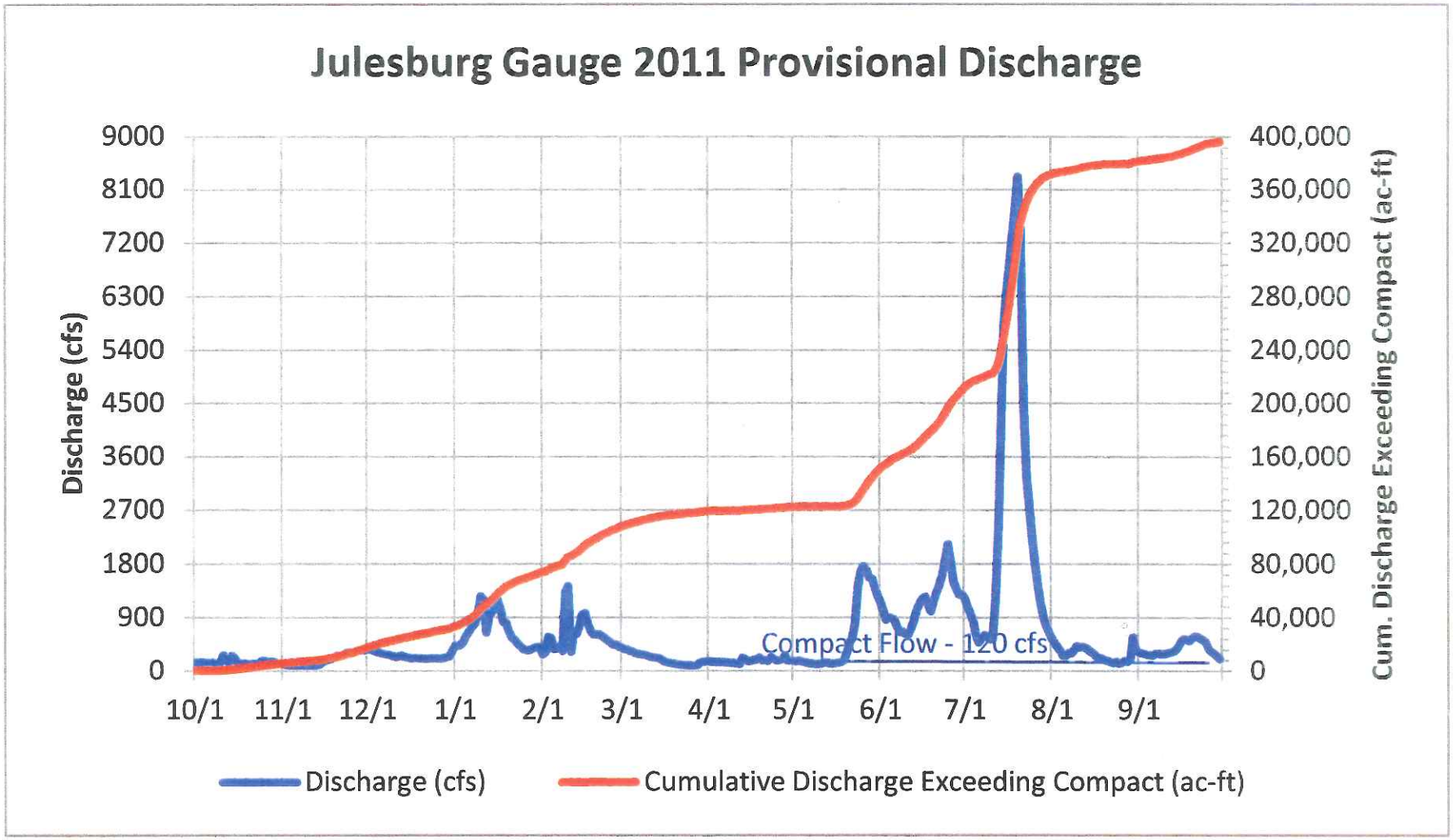


Figure 3
Julesburg Gauge Oct. 2010-Sep. 2011
Provisional Data



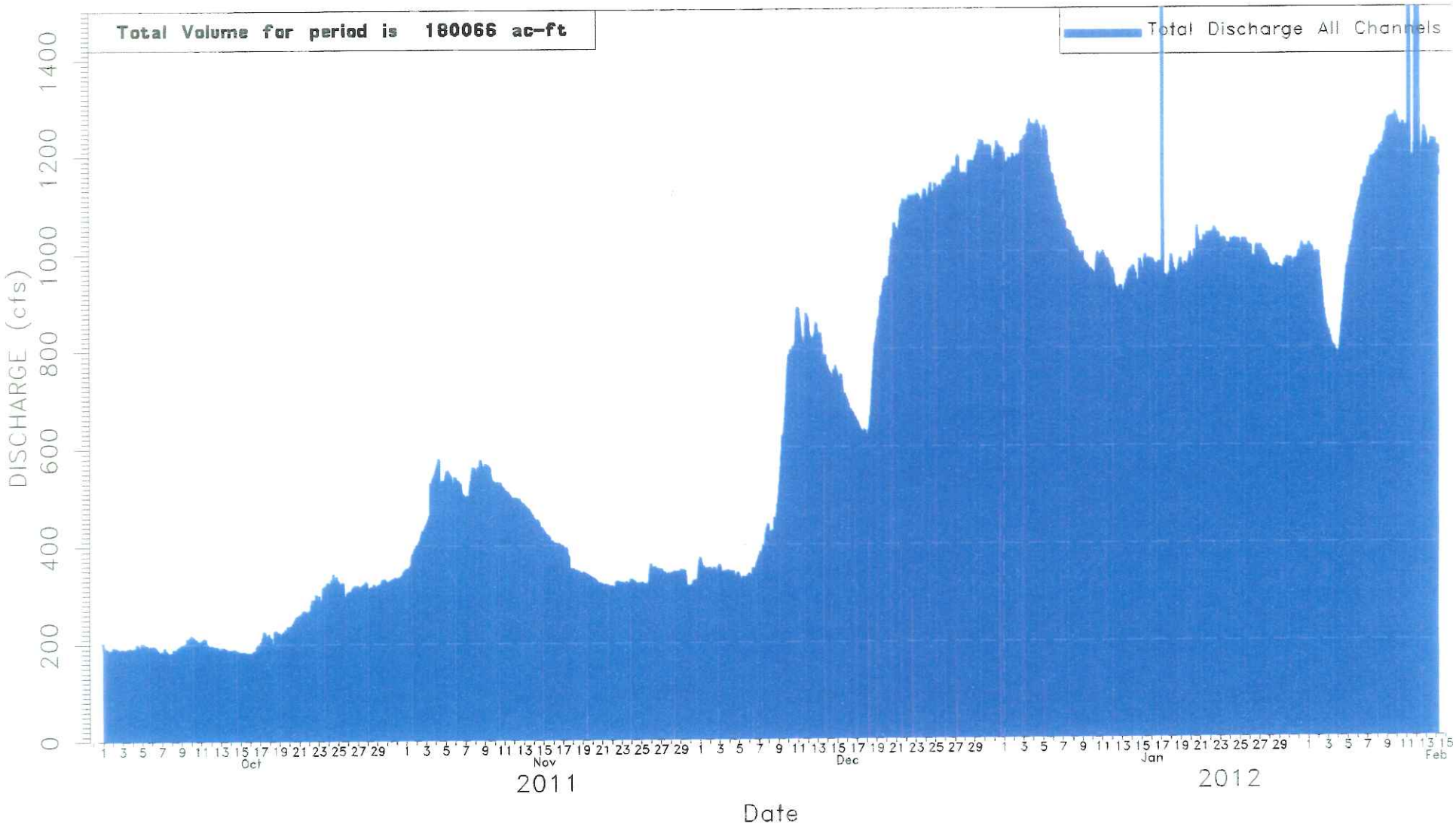
Most Recent Flow Measured 9/30- 201.9 cfs

Cumulative Flow Exceeding Compact thru 9/30 - 395,473 ac-ft

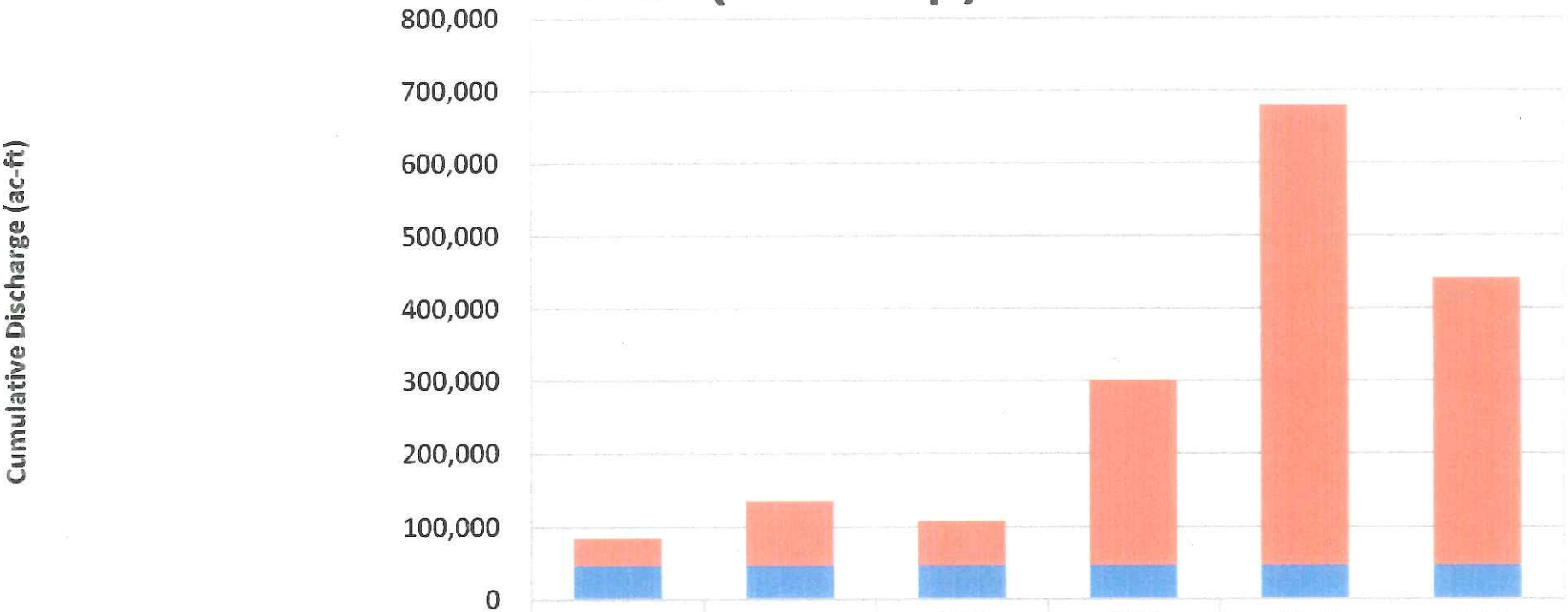


Julesburg Combined Water

October 1, 2011 to February 14, 2011 Provisional Data



Julesburg Gauge Annual Discharge by Water Year (Oct.-Sep)



	2006	2007	2008	2009	2010	2011
Cumulative Discharge Exceeding Compact	38,508	89,594	61,779	253,779	632,509	395,473
Discharge Required to Meet Compact	46,889	46,889	46,889	46,889	46,889	46,889

Compact Requirement Assumed to be 120 CFS from April 1 to October 15

Consideration of Current Water Administration Policies

When the Colorado Supreme Court entered its decision in the Empire Lodge Case in 2001 and with the drought of 2002, administration changed to strict priority administration of both ground and surface water. In 2003 and 2004 the legislature passed new laws that delegated new authority to the water courts, eliminated the flexibility of the State Engineer to make management decisions that would increase water usability, and imposed restrictive requirements on how wells could be pumped. This resulted in the State Engineer ordering in 2006 about 2500 of the decreed 9,000 irrigation wells in the South Platte River Basin to stop pumping and curtailed at least 1,500 more irrigation wells from pumping their full decreed supply. The South Platte River no longer has the conjunctive use of both ground and surface water that it was noted for in the 1920-2000 period.

The economic consequences of the strict priority administration are substantial. In addition, there have been significant changes in the South Platte River Basin hydrology. It is now time to evaluate whether our current water administration policies and statutes are maximizing the beneficial use of both ground and surface water as required by the 1969 Ground Water Administration Act, Senate Bill 81. The hydrologic conditions that now exist in the South Platte and which will prevail in the future unless something is changed are as follows:

- **Ground water levels from Denver downstream to Julesburg are at an all time record high** except for the area around Wiggins to Fort Morgan. This has resulted in drainage problems, salinization of irrigated fields and greater non beneficial consumptive use by phreatophytes.
- **South Platte River flows to Nebraska were 640,000 more than compact requirements in water year 2010 and 112,000 acre feet from 10/1/2010 to 5/1/2011** because of the high ground water levels and current water administration policies.
- Ground water has historically been used to supplement both direct flow diversions and surface reservoir releases for over 100 years and yet both the **SWASI 2010 and IBCC reports do not consider how the 10.5 million acre feet stored in the South Platte alluvium can be used to meet future forecast demands, nor even recognize the 640,000 acre-ft that went to Nebraska.**
- It is **necessary to manage the ground Water levels to control South Platte River flows** and to maximize the conjunctive use of both ground and surface water to maximize the water available for Colorado citizens.

We need to determine what changes in water administration policies or statutes must be made to allow us to capture and use the water in Colorado now and for the future.

May 6, 2011

Robert Longenbaugh
Consultant Water Engineer

John C. Halepaska and Associates, Inc.
303-794-1335

HALEPASKA AND
ASSOCIATES

John C. Halepaska and Associates, Inc.
Water Resources Consultants
26 West Dry Creek Circle
Suite 640
Littleton, Colorado 80120
303-794-1335 PH
303-794-3245 FX

www.halepaska.com

February 7, 2012

Governor John W. Hickenlooper
136 State Capital
Denver, CO 80203-1792

Re: South Platte River and South Platte River Aquifer

Dear Governor Hickenlooper:

The undersigned have been asked by Scott Szabo to send you a letter describing our perspective concerning the groundwater versus surface water issues in the South Platte River Basin. We have been involved in analyzing the groundwater table elevations and the river flows to Nebraska over the past four years and both of us have over 40 years experience working with alluvial aquifers, groundwater models, artificial recharge, and conjunctive use of surface and groundwater.

We recently coauthored two reports, one in August 2010 entitled "The South Platte River as an Irrigation Source – The Importance of Ground Water Data" and an updated report with the same title dated July 2011. The major conclusions from our previous experience and the recent data are as follows:

- There have been significant changes in how irrigation wells have been administered. Prior to the 1969 Groundwater Administration Act there was no administration of wells in the priority system. In the early 1970's wells obtained their own water court decrees and until 2002 they operated pursuant to substitute supply plans approved by the State Engineer or under court approved augmentation plans. Beginning in 2002 wells were administered under strict priority and beginning January 1, 2006 had to have court decreed augmentation plans. This change in administration has resulted in 2,400 of the decreed 8,400 wells are totally curtailed from pumping and at least 1,600 more are partially curtailed each year.

- The groundwater levels in most of the observation wells from Denver to Julesburg are at an all time record high. These high groundwater levels are causing water logging and drainage problems beneath many agriculture fields, basements have been flooded, infrastructure such as sewage treatment plants have failed, phreatophytes are wasting more water because of their increased nonbeneficial consumptive use, and the high water levels cause increased groundwater return flow to the river resulting in increased river flow to Nebraska above compact requirements.

- There are increased flows in the South Platte from Denver to Julesburg due to the higher water levels. This has resulted in higher diversion rates over longer periods of time for many of the surface canals. Many ditches now have more water than they ever diverted before 2006. The most serious problem is the delivery of hundreds of thousands of acre feet of excess flow to Nebraska above the amount required by the compact. That water needs to be used in Colorado.

- Curtailment of well pumping and augmentation decrees requiring augmentation for 100 percent of the consumptive use due to irrigation well pumping has caused major economic impact to: individual farmers (there have been many foreclosures), to county governments due to drop in assessed valuation associated with change from irrigated to dry land farming and also to the State of Colorado because of the reduction in income from irrigated agriculture. There are reports of as many as 80,000 acres of irrigated land have been dried up in Weld and Morgan counties because of the strict water administration and curtailment of irrigation wells.

- Over the past 10 years there has been a promise that the South Platte Decision Support System, SPDSS would provide the necessary technology and a groundwater model that could be used for managing and administering both the ground and surface water of the South Platte. Although a groundwater model has been developed the project administrators now acknowledge it can <u>not</u> be used to evaluate management and administrative decisions. Supposedly it is only useful for evaluating large scale long term planning decisions. It is time now to acknowledge politically, technically, and legally that the SPDSS will not address the critical issues.

The above five conclusions are based upon our knowledge of groundwater hydrology for a stream/aquifer system like the South Platte River Basin. It is time now to seek change in how we are administering both the ground and surface water in the South Platte Basin and also the Arkansas and Rio Grande River Basins. Failure to take action now will have dire consequences for Colorado's irrigated agriculture.

We have attached as an addendum a letter dated February 6, 2012 which contains more of the history and describes in more detail the basis for the above five conclusions. We would be happy to answer any questions and could meet to discuss the issues further.

Sincerely,

John C. Halepaska, PH.D., P.E.
President

Robert A. Longenbaugh, P.E.
Consultant Water Engineer

Attachment: Addendum 2/6/2012 Letter

cc: John Stulp

DRAFT
Dominion and Control, Injury and Pore Space

By: John C. Halepaska & Robert Longenbaugh

In 2006 strict administration of irrigation wells started in the South Platte River Basin. Essentially surface water irrigators followed the historical priority system and all well users had to have a court decreed augmentation plan to replace their depletions to the river in order to pump. The augmentation plan describes how the consumptive component of well irrigation must be returned in time, place and amount to prevent injury to senior surface rights. In this philosophy, the surface irrigators reign supreme and can't be injured by any well irrigator.

One of the main tenets of water law is the issue of "Dominion and Control". In a broad sense, to obtain a water right one has to demonstrate "Dominion and Control", often the infrastructure necessary to divert, control and/or store the water, and put it to the intended beneficial use. The timing, location and amount of river accretion occurring due to artificial recharge are not generally under the control of the operator of the recharge site. He may control when and how much water is placed into the recharge site, but once the water goes underground then geology, hydrology and natural processes control when it reaches the river.

With the advent of Strict Administration and the need for augmentation plans, facilities are being constructed that take Platte River water under their own junior priorities or during periods of free river conditions and places it into recharge basins. The augmentation decrees contain equations that detail how the well depletions due to pumping and accretions to the river due to artificial recharge will arrive back to the river in time, place and amount. The augmentation decrees allow the quantification of excess river accretions that can then be sold to other well owners or junior water rights that need augmentation water. "Dominion and Control" should be clearly required as part of the recharge process to assure that wet water is actually returned to the River to prevent injury to the senior surface rights. Those entities claiming river accretions argue that they are legally entitled to the specific amounts because the augmentation decrees deem it so. There are no physical measurements that demonstrate that the accretions actually arrive at the river at the time, place and amount specified in the decree.

Property owners near the artificial recharge structures or those between those structures and the river are generally not a party in the water court augmentation decrees. For the water to reach the river it must flow as groundwater through the alluvium beneath their property. Many property owners own the mineral rights including the sands and gravels constituting the alluvium. The question arises as to how the recharging entity maintains "Dominion and Control" of the water flowing through the aquifer beneath another owner's property.

Current practices where the entity that artificially recharges water to the aquifer and claims river accretions to offset well depletions or sells excess accretions does not commonly negotiate or even communicate with intervening property owners. Certainly the recharging entity does not maintain "Dominion and Control" of the intervening properties or control the flow through the alluvial aquifer.

It becomes even more questionable when the artificial recharge causes a rise in the ground water levels beneath others property causing flooding of basements or the actual rise of groundwater levels

causing flow to occur at the land surface or the ponding of the artificially recharged water. The high ground water levels have also caused drainage problems in nearby agriculture fields with the resulting loss of crops and increased salinity problems. Higher water tables due to artificial recharge have increased evaporation and transpiration loss back to the atmosphere due to increased beneficial consumptive use by crops and non-beneficial loss by phreatophytes. Clearly these other physical processes have reduced the amount of groundwater flowing toward the river.

Let's now examine the situation, where a ditch company or other entity petitions the court to construct a recharge facility and provides all of the necessary legal and engineering documents and the court enters a decree. The entity moves ahead and begins the process of artificial recharge and as a result invades the pore space under property between the recharge location and the river. Invasion of the pore space underground between the recharge location and the river that raises the background water levels to the point of injury by flooding or water logging is possible. On the one hand the recharging interest has an augmentation decree that describes all aspects of his project, including time, place and amounts of river accretions. He can potentially buy sell or lease the excess credits that are created by operating the augmentation plan. If he must demonstrate in the augmentation plan that he can maintain "Dominion and Control", then flooding of adjacent properties must be intentional, or he made a mistake in the engineering of the plan and he should have to go back to court and modify the plan.

Clearly, in order to devise a system that legally creates a market place for excess water accretions to the river, the system requires an engineering report that demonstrates "Dominion and Control" of the water from the time it enters the recharge structure until it enters the River at the required time, place and amount to prevent injury to the senior surface rights. The Water Court should not grant an augmentation decree which does not show that the applicant can maintain "Dominion and Control" between the artificial recharge structure and the river. The court should require collection of field data to verify the time, place and amount of calculated river accretions. Previous decrees which do not document "Dominion and Control" should be reopened and modified pursuant to the retained jurisdiction provisions in all augmentation decrees.