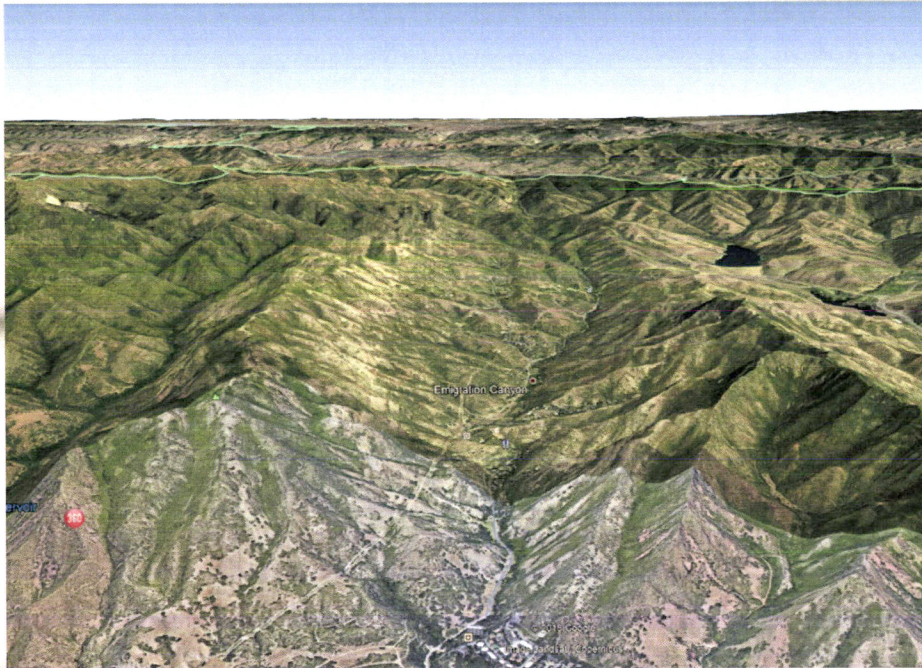


Salt Lake City Department of Public Utilities

SCANNED RC

Protest of Water Right Change Application



**WR 57-7796
(a44045)
WR 57-10711
(a44046)**

Dr. David E. Hansen, Ph.D., P.E

December 19, 2018

HEARING SUBMITTAL TO
DIVISION OF WATER RIGHTS

Right No.: 57-7796 (a44045)

Date: 19 Dec 2018

Submittee: PROTESTANT

SALT LAKE CITY
By DAVID HANSEN

**HANSEN
ALLEN
& LUCE inc**
ENGINEERS

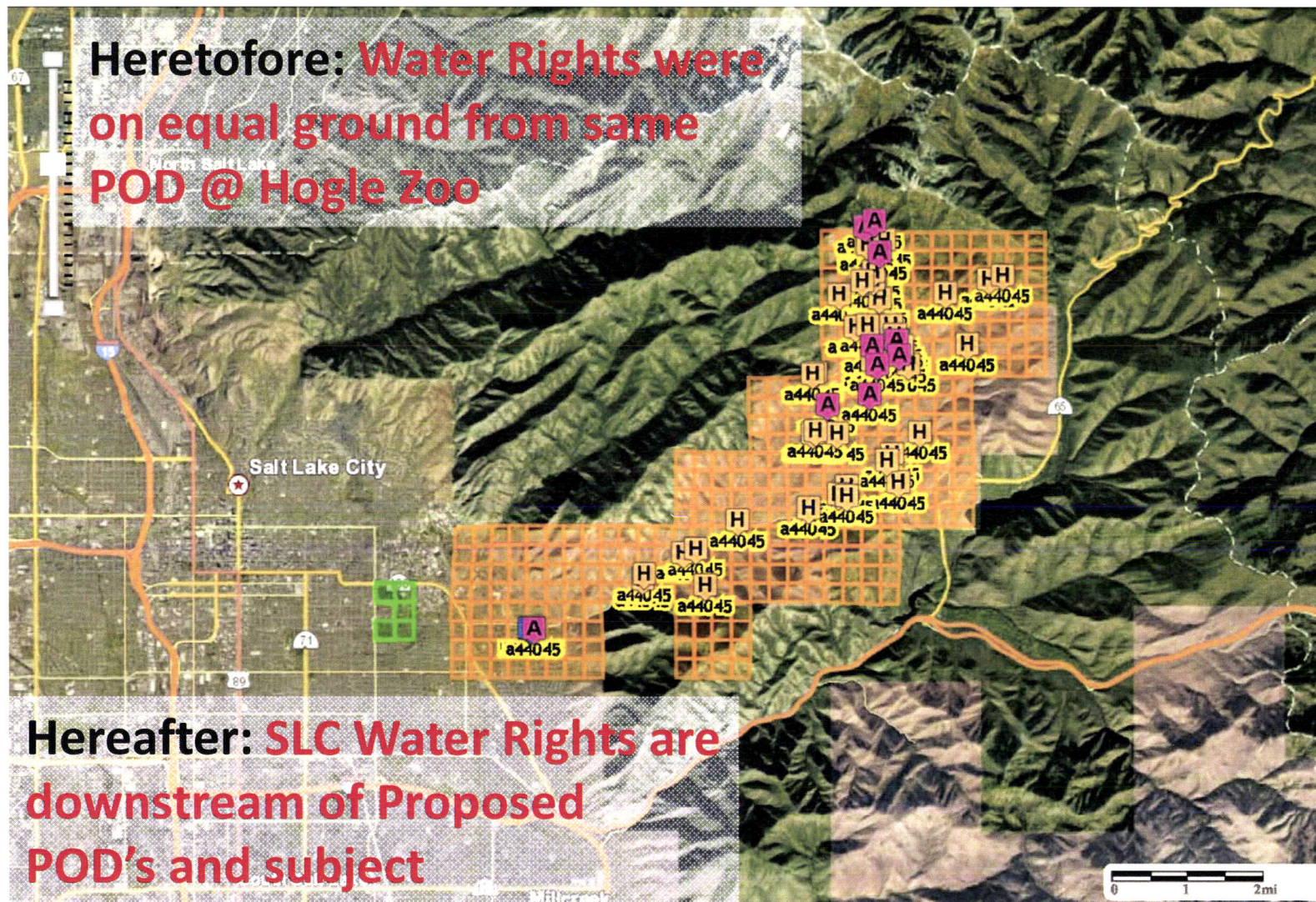
57-10711 (a44046)

1/17

Salt Lake City Water Rights

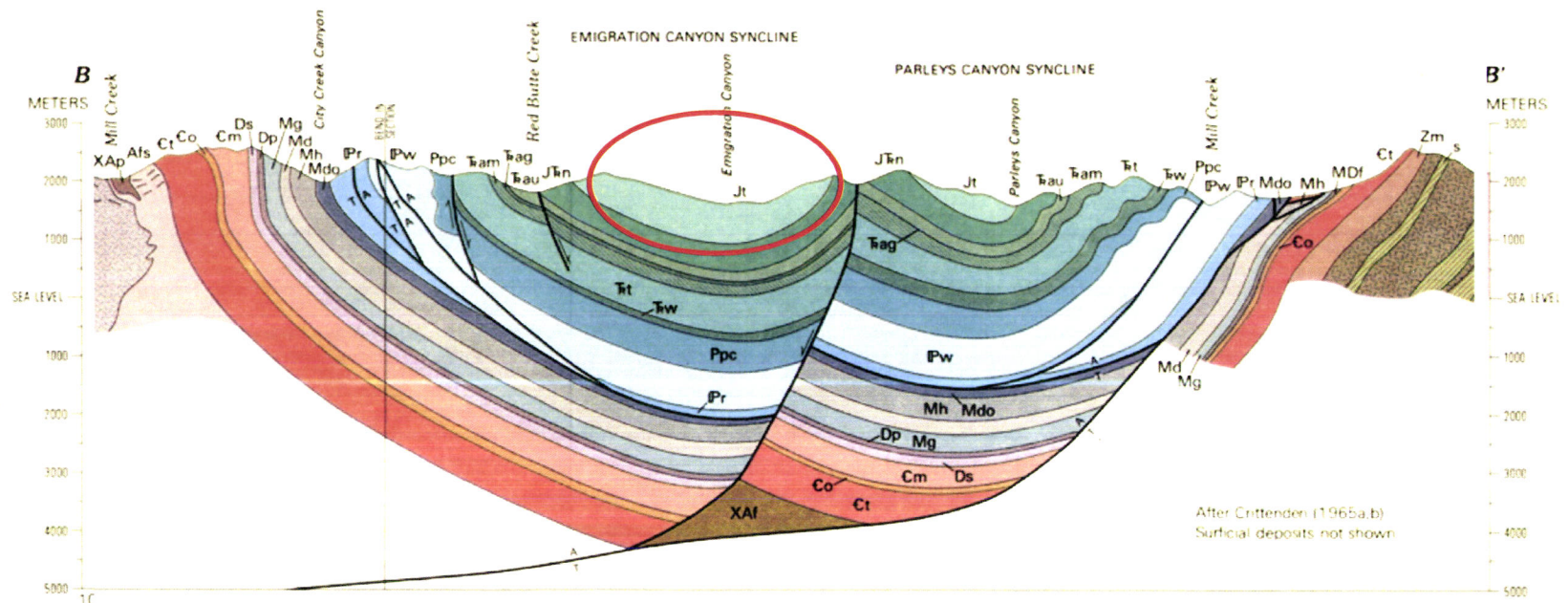
- 57-8855:.. 40 ac-ft: Irrigation Right
Period of Use: Apr 1 – Oct 31
POD: Mouth of Emigration Canyon
- 57-8496:.. 102.386 cfs: Municipal Right
Period of Use: Jan 01 – Dec 31
POD: Mouth of Emigration Canyon
- 57-8497:.. 0.208 cfs: Municipal Right
Hogle Zoo
Period of Use: Jan 01 – Dec 31
POD: Mouth of Emigration Canyon

Salt Lake City Water Rights



GEOLOGY

Northwest – Southeast Cross Section through Emigration Canyon



The geologic Syncline promotes the capture and conveyance of water down the canyon, tributary to SLC's Water Rights

EID 1966 Change Application ..

Hereafter Explanatory in EID approved Change Application a17521 on 12/31/1996

- “This permanent change application is to replace a6538 previously filed by EID. It is filed so as to receive authorization to ***develop an adequate water supply for canyon residents***. The water will be used for the municipal purposes with-in the Emigration Improvement District's service area. ***The maximum development of the water resources is the subject of a current engineering study*** and the future growth of the canyon.”

1966 Jack Barnett Study

The August 1966 study completed by Jack Arnold Barnett concluded:

- **“If larger wells were constructed** in areas where domestic well development has already taken place, and **these wells produced large amounts of water, influence on the water levels in the domestic wells would be almost a certainty**, It is probable that this influence could be measured directly, and it **could be of significance to the domestic well owners**. The very **low specific capacities of the domestic wells indicate that the aquifers are not able to yield water readily to the wells. The drawdown of the water levels was several feet in some of the domestic wells when they were pumped at only a few gallons per minute.**”
- **“It is doubtful that present well development has had the effect of interfering with surface water rights, at least in quantity. The total production of the wells in the canyon is less than one fortieth the annual average stream flow.”**

**1/40th 1901 – 1965 average flow is 0.15 cfs (110 af/yr)
a44045 is for 600 af/yr**

1966 Jack Barnett Study – Cont'd

- “It is doubtful that the ground water exists in sufficient quantities to allow the development of large volumes of water by wells, except on a limited basis in areas of the canyon other than near the stream channel. The Twin Creek sub-district, Preuss sub-district, and Kelvin sub-district below Burr Fork appear to have the best supply of ground water both from a quantity and quality standpoint. **Development in these areas should be limited to small-diameter, domestic wells if influence on existing rights is to be avoided.**”
- “The **return flow** of water diverted from the wells for domestic purposes will be **greatly reduced** if the Salt Lake County Board of Health requires all **homes to use sealed vaults** as a pollution control measure in place of septic tanks.”
- “The surface water and the ground water are **closely related**”.

1966 Jack Barnett Study – Cont'd

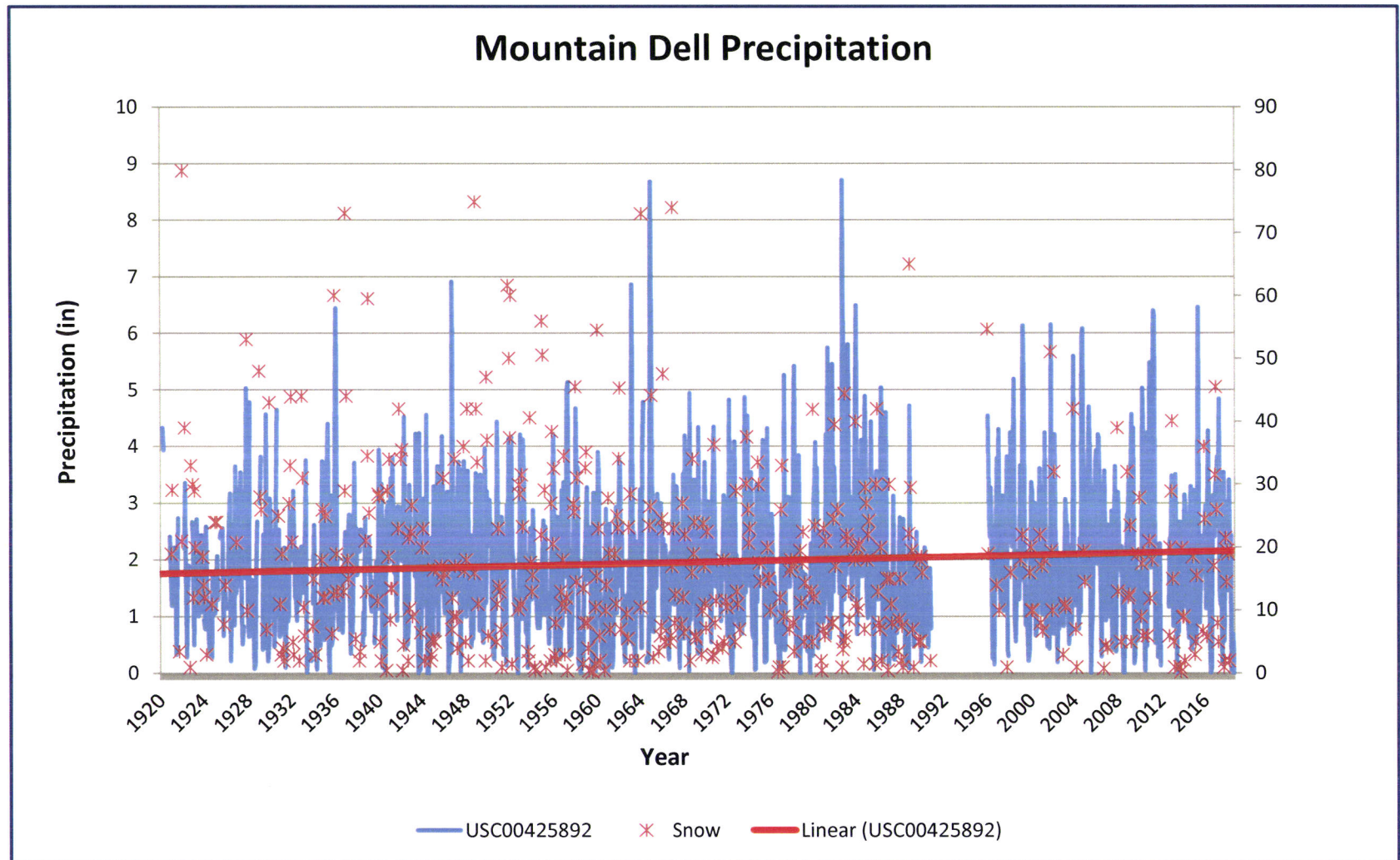
- “A seepage run during the summer of 1965 established the fact that **some reaches of the stream channel were gaining water from ground-water** contributions and other reaches were losing water to the ground water.”
- “Future development of **large-diameter wells** to produce supplies of water much **greater than is required for the domestic needs of one family could significantly influence already established surface-water and ground-water rights.**”

1988 Interference

Freeze Creek Drainage Impacts

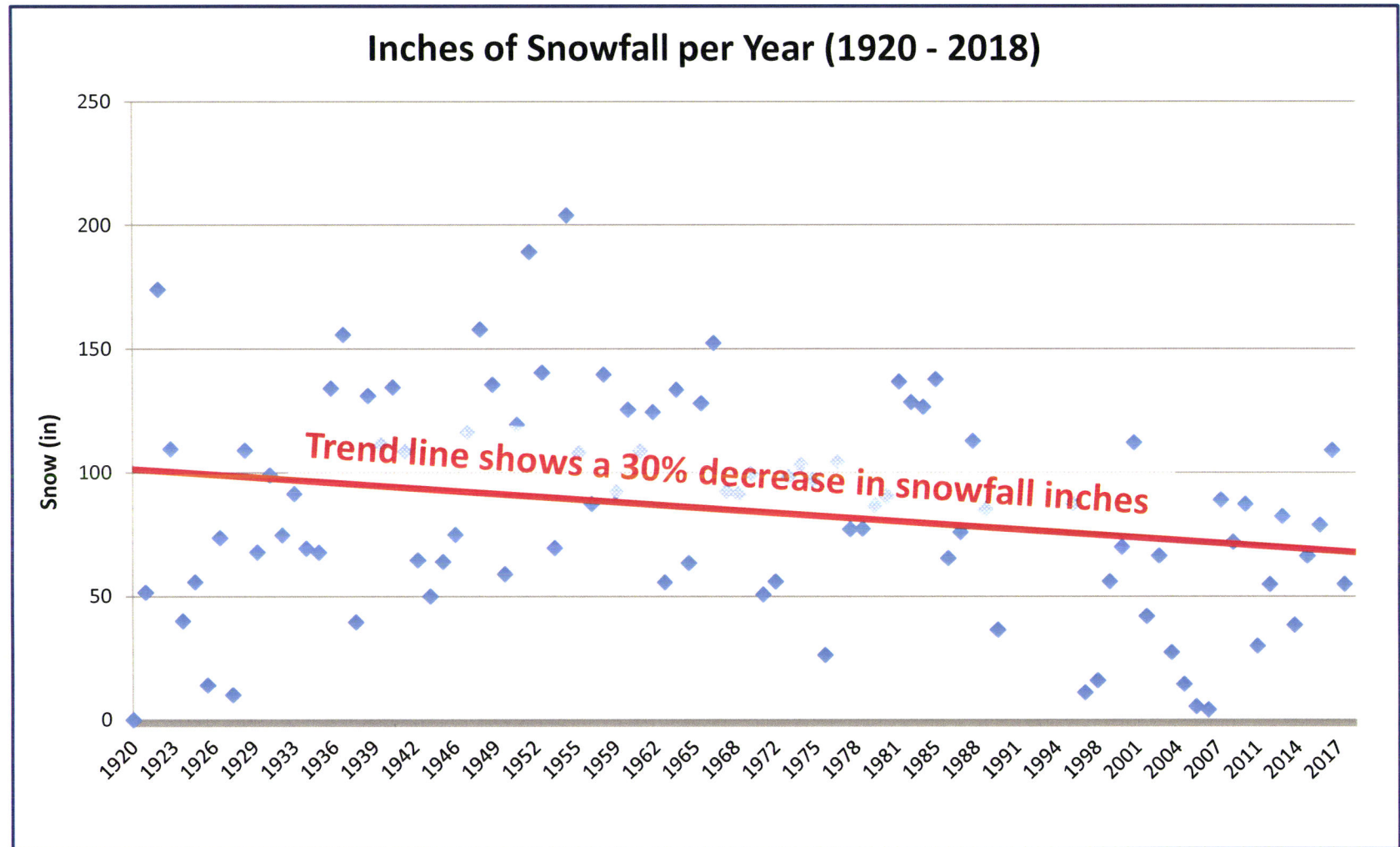
- M. Michael Stewart, letter dated October 11, 1988.
 - No flow conditions in Freeze Creek in May and more frequent no flow conditions in fall periods.
 - Private well water level dropped more than 45 feet.
 - Severe well and ground water impacts are attributed to Boyer well.
- Salt Lake County expressed concern over the canyon development potential, letter dated November 2, 1988.
- Boyd Clayton Memorandum dated November 16, 1988.
 - Surface flow impact from well development is possible.
 - Stream loses in Section 27 and gains in Section 33.

CLIMATE CHANGE



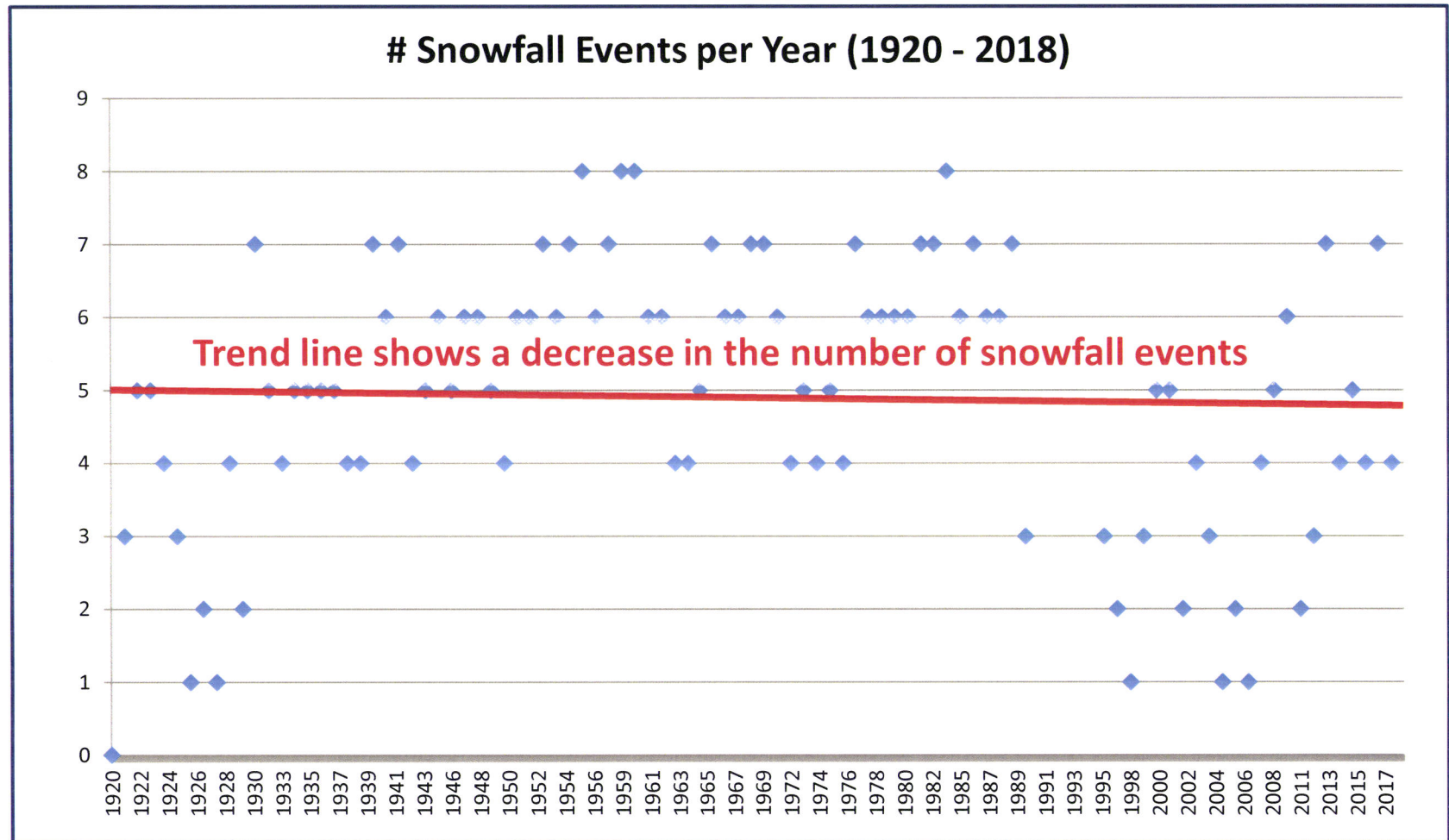
Although the Precipitation Trend is increasing, the number of snowfall events is decreasing

CLIMATE CHANGE – Cont'd



Snow increases ground water recharge
Rain increases runoff

CLIMATE CHANGE – Cont'd

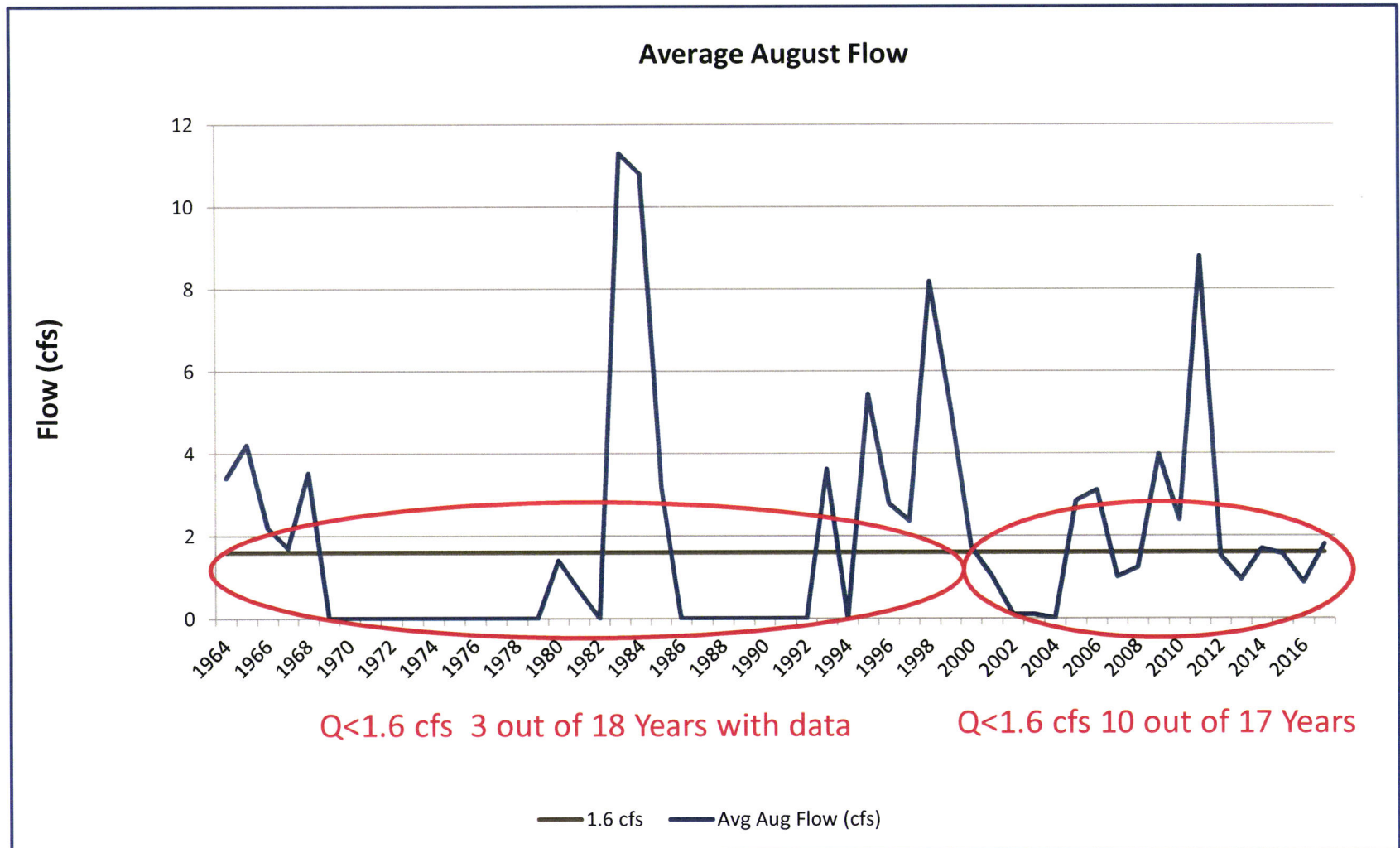


Snow increases ground water recharge

Rain increases runoff

CLIMATE CHANGE or IMPACT? ..

SCANNED RC



December 2018 Observations..

SCANNED RC



No Flow at Ruth's Diner



0.69 cfs Flow at Gaging Station

December 2018 Observations – Cont'd.

SCANNED RC



0.77 cfs Flow at Foothill Blvd



0.73 cfs Flow at 1100 East

2018 Observations

- At Mt. Olivet diversion at the zoo, a concerned SLC resident at about 2100 East 1300 South observed:
 - Creek has been dry except 2-3 times – 11/27/18 email
 - Creek was often dry in the summer of 2017
- There are an estimated 685 mailboxes in the Canyon (Mark Tracy – ECHO President)
 - There are ~50 Connections with SLC
 - There are ~ 286 connections with EID
 - This leaves ~ 349 connections to private wells
 - This leaves 15 new residences before the canyon reaches its 700 household limit.
 - EID's change application, if approved, will potentially exceed this limit by potentially over a factor of 10

Enough time and data have been collected and observed to show that there are significant negative impacts to continued development within Emigration Canyon