


PROTECTING WATER QUANTITY AND QUALITY

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IMPACTS TO QUANTITY

- Interference with existing aquifers and wells.
 - Reduction in ground water supplies.
 - Reduction in surface supplies.
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DANGER
FLAMMABLE GAS
NO OPEN FLAMES
NO TRESPASSING



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FLAMMABLE GAS
NO OPEN FLAMES
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WARNING

DO NOT OPEN THIS ENCLOSURE
UNLESS YOU ARE A QUALIFIED
ELECTRICIAN OR A LICENSED
ELECTRICIAN. IF YOU ARE
NOT A QUALIFIED ELECTRICIAN
OR A LICENSED ELECTRICIAN,
DO NOT OPEN THIS ENCLOSURE.
SEE THE INSTRUCTIONS FOR
SAFETY INFORMATION.

DO NOT TOUCH THE ELECTRICAL
COMPONENTS INSIDE THE
ENCLOSURE. THE ELECTRICAL
COMPONENTS ARE HOT AND
CAN CAUSE BURNS OR
DEATH. ALWAYS USE
APPROPRIATE SAFETY
PRECAUTIONS. ALWAYS
USE THE CORRECT
TOOLING AND
EQUIPMENT.

WARNING

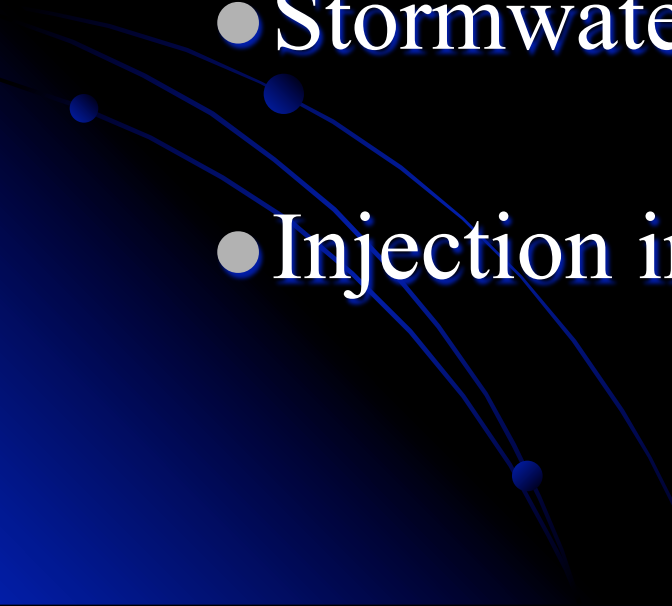
HIGH VOLTAGE
DO NOT ENTER THIS ENCLOSURE
SEE THE INSTRUCTIONS FOR
SAFETY INFORMATION.

NO PCBs
USE OF THIS PRODUCT
IS LIMITED TO THE
USE OF THIS PRODUCT

COLORADO OIL AND GAS CONSERVATION COMMISSION (“COGCC”)

- COGCC orders remediation program to address methane in domestic wells.
- “COGCC staff and any affected residents shall be provided immediate notice of any condition *which causes, or threatens to cause*, a significant *adverse impact on the environment*, including, but not limited to, the water quantity *or quality of the shallow aquifer* or indications that the area impacted by the gas has expanded.”

IMPACTS TO QUALITY

- Main water quality impacts:
 - Discharge of industrial waste.
 - Stormwater.
 - Injection into underground aquifers.
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FRACKING CONTAMINANTS

- Fracking fluids contain chemicals that can be toxic to humans and wildlife, and known carcinogens, such as benzene.
- Very small quantities of benzene are capable of contaminating millions of gallons of water.

FRACKING CONTAMINANTS

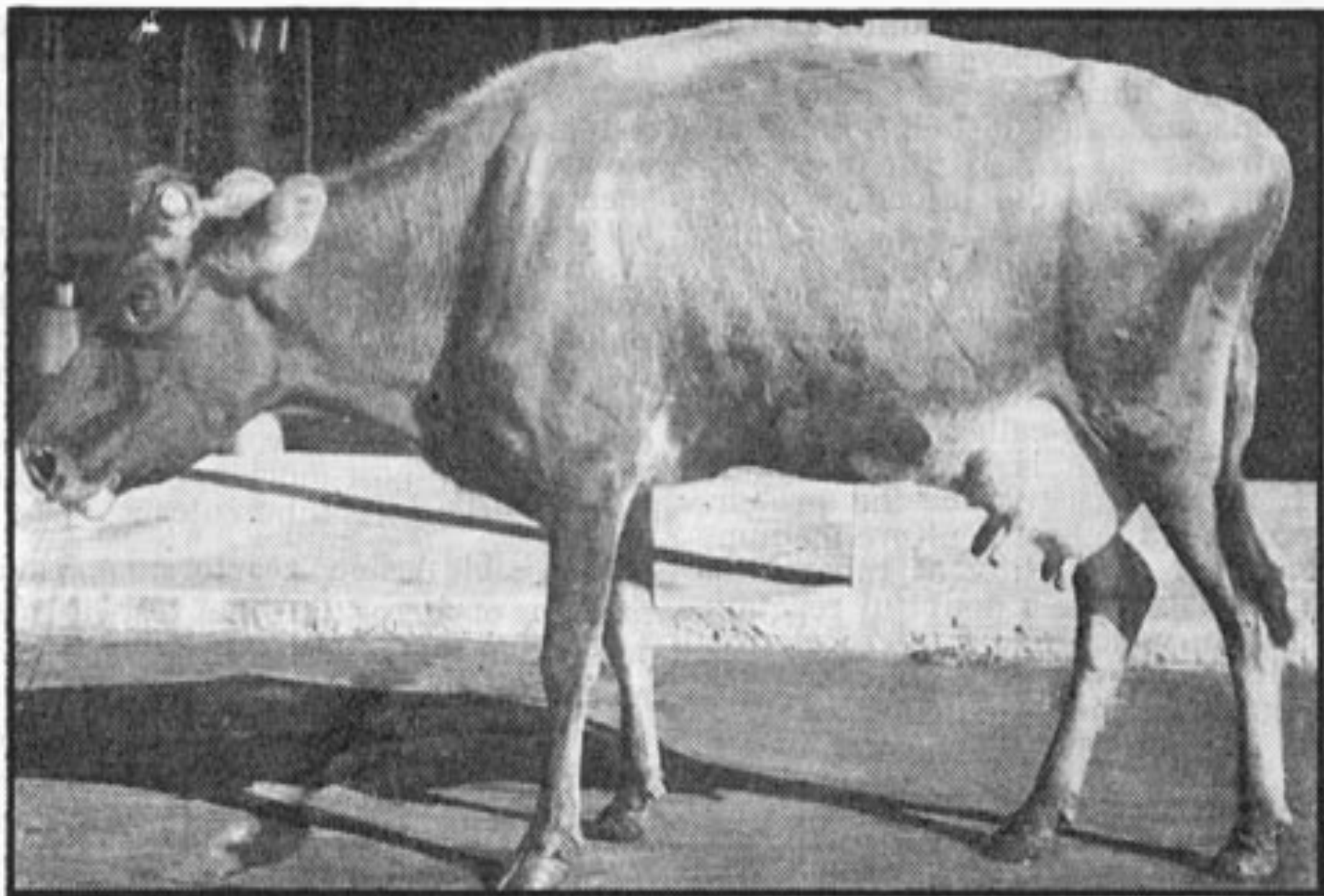
- Ethylbenzene
- Toluene
- Naphthalene
- Formaldehyde
- Ethylene glycol
- Hydrochloric acid
- Sodium hydroxide

SODIUM ABSORPTION RATIO ("SAR")

- SAR is the proportion of sodium ions in relation to the concentration of calcium and magnesium.
- High SAR levels create serious soil problems which prevent plants from effectively absorbing water.
- Also adverse impacts to livestock, aquatic and human life.







Cows in the last stages of tuberculosis become weak and emaciated.



COLORADO DEPARTMENT OF HEALTH AND THE ENVIRONMENT (“CDPHE”)

“The continued practice of discharging the untreated produced water (i.e, high Sodium Adsorption Ratio, SAR, values and high sodium concentrations) into the Cucharas River, under specific hydrologic conditions, creates a known threat to the beneficial agricultural use of this state water by impairing the suitability of this river water when diverted for agricultural uses.”

CDPHE

“Specifically, there has been damage to corn fields, soils, and dairy cattle when water was diverted (Holita Ditch) from the Cucharas River to a storage pond (Holita Reservoir) and then and routed to the Corsentino Dairy for these agricultural uses. The damage was first reported in 2006 and has been confirmed by soil scientists from Colorado State University and USDA’s National Salinity Team.”

COLORADO REGULATES OIL AND GAS-RELATED GROUND WATER DIVERSIONS

- *Vance v. Wolfe*:
 - CBM ground water diverters must get a well permit.
 - And an “augmentation plan.”
- SEO interprets this to apply to all oil and gas wells not just CBM.

COLORADO LAW

“Any substituted water shall be of a *quality* and *quantity* so as to meet the requirements *for which the water of the senior appropriator has normally been used*”

C.R.S. § 37-92-305(5)

COLORADO LAW

Public policy “to conserve state waters and to protect, maintain, and improve, where necessary and reasonable, *the quality thereof for public water supplies*, for protection and propagation of wildlife and aquatic life, for domestic, agricultural, industrial, and recreational uses, and for other beneficial uses.” C.R.S. § 25-8-102(2)

CLEAN WATER ACT

- Prohibits discharge of any pollutants to waters of the US without a permit.
- Permits developed by reference to numeric limits of regulated constituents and “narrative” limits.
- As a practical matter, narrative limits are rarely the subject of actual water quality limitations.
- When the content of discharged water is not known (or when industry refuses to disclose), how can CWA to regulate discharges?

CLEAN WATER ACT

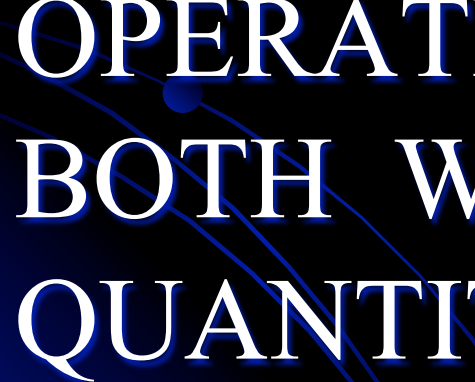
- Stormwater has been identified as one of the primary causes of pollution in the US.
- 1987 amendments to CWA provide for regulation of stormwater.
- EPA adopted regulations to extend stormwater regulation to oil and gas operations.

CDPHE

- EPA discharge permitting handled by CDPHE.
- No discharge of pollutants into State waters without a permit.
- “State waters” include surface and groundwater.

THE BOTTOM LINE

STATE AND FEDERAL LAW
APPLIES TO OIL AND GAS
OPERATIONS AND PROTECTS
BOTH WATER QUALITY AND
QUANTITY.



QUESTIONS?

