

PRODUCED WATER

OWNERSHIP & TREATMENT AS AN ECONOMIC PRODUCT



PERKINS PEISERICH GREATHOUSE MORGAN RANKIN

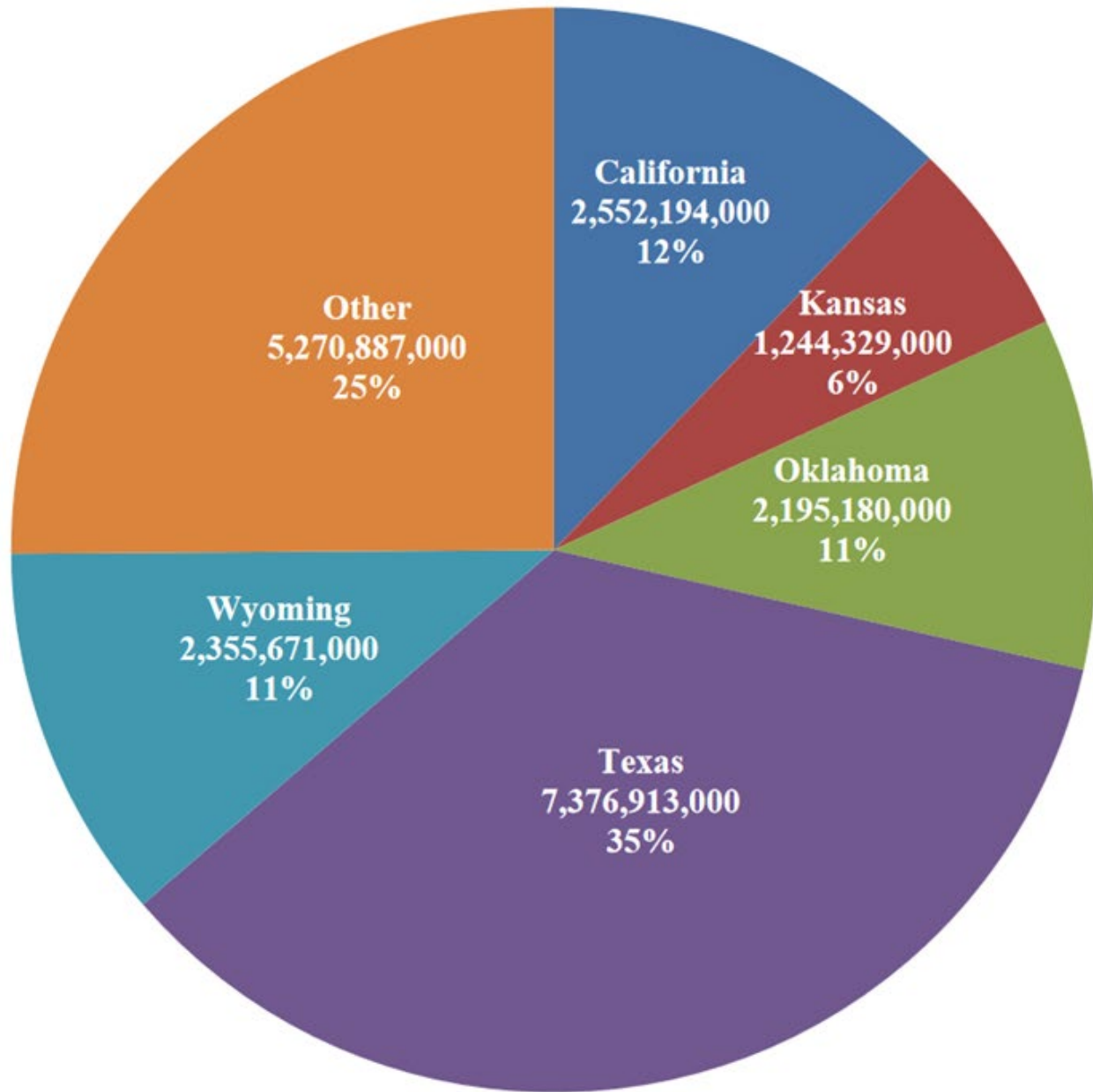
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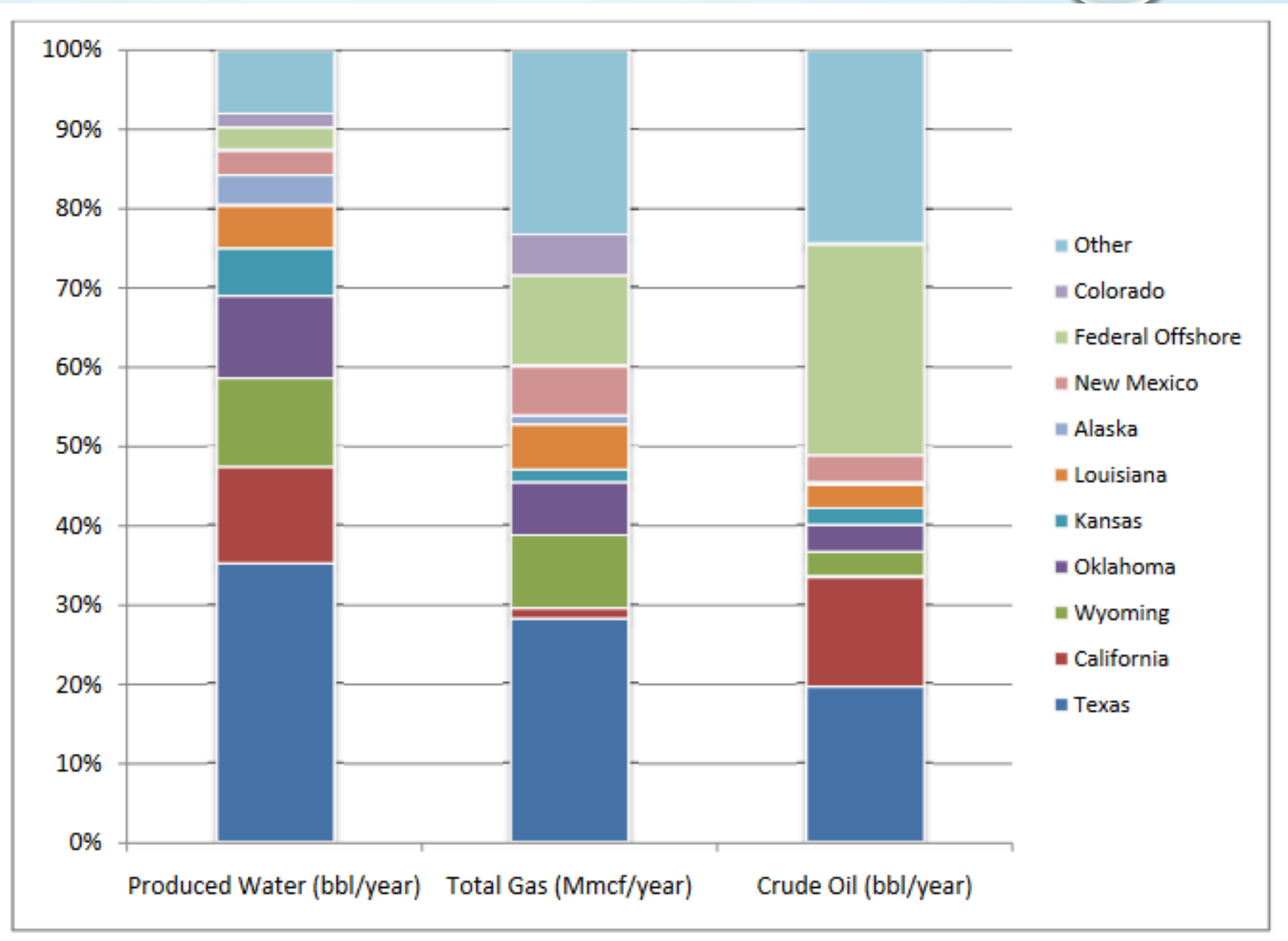
A FEW FACTS...

- APPROXIMATELY 21 BILLION BBLs PRODUCED ANNUALLY
- FROM ABOUT 900,000 WELLS
- WATER-TO-OIL RATIO
 - HIGHLY VARIABLE
 - SOUTH DAKOTA (2.5 BBL/BBL) VS ILLINOIS (42.7 BBL/BBL)
 - NATIONAL AVERAGE IS 7.6 BBL/BBL, 5.3 BBL/BBL WHEN INCLUDING OFFSHORE PRODUCTION
- WATER-TO-GAS RATIO
 - ALSO HIGHLY VARIABLE
 - SOUTH DAKOTA (0.04 BBL/MMCF) VS KANSAS (>1,200 BBL/MMCF)
 - NATIONAL AVERAGE IS 260 BBL/MMCF; 182 BBL/MMCF WHEN INCLUDING OFFSHORE PRODUCTION

**TOTAL
PRODUCED
WATER IN
BBL BY
STATE
(2007
DATA)**

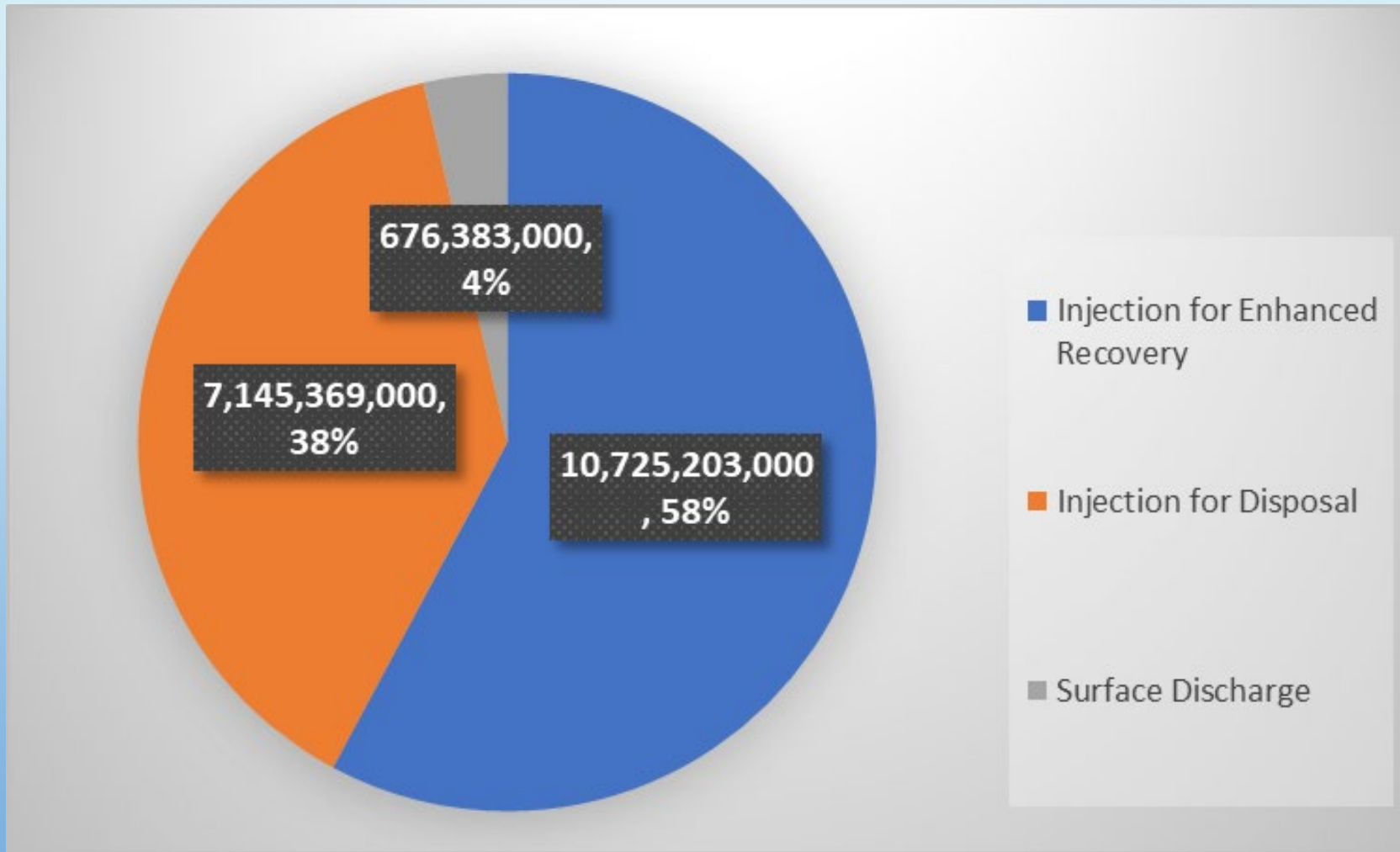


PRODUCED WATER VS HYDROCARBO N PRODUCTION



HOW IS IT MANAGED?

Annual
Onshore
Production
in BBLs



CLASSES OF GROUNDWATER RIGHTS

- ABSOLUTE DOMINION
- CORRELATIVE RIGHTS
- PRIOR APPROPRIATION
- REASONABLE USE (COMMON LAW)
- REASONABLE USE (RESTATEMENT)

ABSOLUTE DOMINION

- CONNECTICUT
- GEORGIA
- INDIANA
- LOUISIANA
- MAINE
- MINNESOTA
- MASSACHUSETTS
- MISSISSIPPI
- RHODE ISLAND
- TEXAS
- VERMONT

CORRELATIVE RIGHTS

- CALIFORNIA
- MINNESOTA
- IOWA
- ARKANSAS
- VERMONT
- OKLAHOMA

Note: Nebraska follows a combination of this doctrine and the Reasonable Use doctrine.

PRIOR APPROPRIATION

- ALASKA
- COLORADO*
- IDAHO
- KANSAS
- MONTANA
- NEVADA
- NEW MEXICO
- NORTH DAKOTA
- OREGON
- SOUTH DAKOTA
- UTAH
- WASHINGTON
- WYOMING

REASONABLE USE – COMMON LAW

- ALABAMA
- ARIZONA
- DELAWARE
- ILLINOIS
- KENTUCKY
- MARYLAND
- MICHIGAN
- MISSOURI
- NEW HAMPSHIRE
- NEW JERSEY
- NEW YORK
- NORTH CAROLINA
- OKLAHOMA
- PENNSYLVANIA
- VIRGINIA
- WEST VIRGINIA

REASONABLE USE – RESTATEMENT

- WISCONSIN
- OHIO

COLORADO WATER OWNERSHIP

- THE WATER OF EVERY NATURAL STREAM, NOT HERETOFORE APPROPRIATED, WITHIN THE STATE OF COLORADO, IS HEREBY DECLARED TO BE THE PROPERTY OF THE PUBLIC, AND THE SAME IS DEDICATED TO THE USE OF THE PEOPLE OF THE STATE, SUBJECT TO APPROPRIATION AS HEREINAFTER PROVIDED.
- THE DOCTRINE OF PRIOR APPROPRIATION SHALL NOT APPLY TO NONTRIBUTARY GROUNDWATER. TO CONTINUE THE DEVELOPMENT OF NONTRIBUTARY GROUNDWATER RESOURCES CONSONANT WITH CONSERVATION SHALL BE THE POLICY OF THIS STATE. SUCH WATER SHALL BE ALLOCATED AS PROVIDED IN THIS ARTICLE UPON THE BASIS OF OWNERSHIP OF THE OVERLYING LAND.

NONTRIBUTARY GROUNDWATER

- “NONTRIBUTARY GROUNDWATER” MEANS THAT GROUNDWATER, LOCATED OUTSIDE THE BOUNDARIES OF ANY DESIGNATED GROUNDWATER BASINS IN EXISTENCE ON JANUARY 1, 1985, THE WITHDRAWAL OF WHICH WILL NOT, WITHIN ONE HUNDRED YEARS OF CONTINUOUS WITHDRAWAL, DEplete THE FLOW OF A NATURAL STREAM, INCLUDING A NATURAL STREAM AS DEFINED IN SECTIONS 37-82-101(2) AND 37-92-102(1)(B), AT AN ANNUAL RATE GREATER THAN ONE-TENTH OF ONE PERCENT OF THE ANNUAL RATE OF WITHDRAWAL.
- APPROXIMATELY 85% OF THE ACTIVE BASINS IN THE STATE AT ISSUE AND MAJORITY OF OIL AND GAS PRODUCING FORMATIONS WERE DETERMINED NONTRIBUTARY.

PERMITTING USE OF NONTRIBUTARY GROUNDWATER – COLO. REV. STAT. § 37- 90-137(7)(A)

- EXCEPT FOR COAL BED METHANE WELLS, NO WELL PERMIT IS REQUIRED UNLESS THE NONTRIBUTARY GROUNDWATER BEING REMOVED WILL BE BENEFICIALLY USED. EXCEPT FOR COAL BED METHANE WELLS, NO WELL PERMIT IS REQUIRED IF THE NONTRIBUTARY GROUNDWATER BEING REMOVED TO FACILITATE OR PERMIT THE MINING OF MINERALS WILL BE USED ONLY BY OPERATORS WITHIN THE GEOLOGIC BASIN WHERE THE GROUNDWATER IS REMOVED TO FACILITATE OR PERMIT THE MINING OF MINERALS, INCLUDING: INJECTION INTO A PROPERLY PERMITTED DISPOSAL WELL; EVAPORATION OR PERCOLATION IN A PROPERLY PERMITTED PIT; DISPOSAL AT A PROPERLY PERMITTED COMMERCIAL FACILITY; ROADSPREADING OR REUSE FOR ENHANCED RECOVERY, DRILLING, WELL STIMULATION, WELL MAINTENANCE, PRESSURE CONTROL, PUMP OPERATIONS, DUST CONTROL ON-SITE OR OFF-SITE, PIPELINE AND EQUIPMENT TESTING, EQUIPMENT WASHING, OR FIRE SUPPRESSION; DISCHARGE INTO STATE WATERS IN ACCORDANCE WITH THE “COLORADO WATER QUALITY CONTROL ACT”, ARTICLE 8 OF TITLE 25, C.R.S.,¹ AND THE RULES PROMULGATED UNDER THAT ACT; OR EVAPORATION AT A PROPERLY PERMITTED CENTRALIZED EXPLORATION AND PRODUCTION WASTE MANAGEMENT FACILITY.

WYOMING WATER OWNERSHIP

- THE WATER OF ALL NATURAL STREAMS, SPRINGS, LAKES OR OTHER COLLECTIONS OF STILL WATER, WITHIN THE BOUNDARIES OF THE STATE, ARE HEREBY DECLARED TO BE THE PROPERTY OF THE STATE.
- WATER BEING ESSENTIAL TO INDUSTRIAL PROSPERITY, OF LIMITED AMOUNT, AND EASY OF DIVERSION FROM ITS NATURAL CHANNELS, ITS CONTROL MUST BE IN THE STATE, WHICH, IN PROVIDING FOR ITS USE, SHALL EQUALLY GUARD ALL THE VARIOUS INTERESTS INVOLVED.
- PRIORITY OF APPROPRIATION FOR BENEFICIAL USES SHALL GIVE THE BETTER RIGHT. NO APPROPRIATION SHALL BE DENIED EXCEPT WHEN SUCH DENIAL IS DEMANDED BY THE PUBLIC INTERESTS.

BY-PRODUCT WATER; APPROPRIATION; CONDITIONS AND LIMITATION – WYO. STAT. ANN. § 41-3-904

- (A) ANY PERSON INTENDING TO APPROPRIATE BY-PRODUCT WATER FOR BENEFICIAL USE SHALL FILE AN APPLICATION WITH THE STATE ENGINEER ON THE FORMS AND IN THE MANNER PRESCRIBED FOR GROUNDWATER APPLICATIONS. BY-PRODUCT WATER SHALL BE CONSIDERED AS BEING IN THE SAME CLASS AS GROUNDWATER FOR THE PURPOSES OF ADMINISTRATION AND CONTROL. AN APPLICATION MAY BE FILED ONLY IF BOTH THE FOLLOWING CONDITIONS EXIST:
 - (I) THE BY-PRODUCT WATER IS INTERCEPTED WHILE IT IS READILY IDENTIFIABLE AND BEFORE IT HAS COMMINGLED WITH THE WATERS OF ANY LIVE STREAM, LAKE, RESERVOIR OR OTHER SURFACE WATERCOURSE, OR PART OF ANY GROUNDWATER AQUIFER; AND
 - (II) THE DEVELOPER OF THE WATER IS THE APPLICANT, OR AN AGREEMENT IS FILED IN THE OFFICE OF THE STATE ENGINEER WHEREIN THE DEVELOPER OF THE WATER GIVES THE APPLICANT PERMISSION TO USE THE WATER AS PROPOSED IN THE APPLICATION. THE AGREEMENT MUST BE SIGNED BY THE DEVELOPER OF THE WATER, AND MAY CONTAIN PROVISIONS FOR RESERVATION OF THE WATER TO THE USE OF THE DEVELOPER-GRANTOR, AND IF SO STIPULATED, THE RESERVATION CAN BE SUPERIOR IN RIGHT AND TITLE TO ANY USE BY THE APPLICANT-GRANTEE.
- (B) IN ALL OTHER CASES, AN APPLICATION TO APPROPRIATE BY-PRODUCT WATER SHALL BE GOVERNED BY THE LAWS PERTAINING TO SURFACE WATER, AND BY-PRODUCT WATER SHALL BE CONSIDERED AS PART OF THE SURFACE SUPPLY, SUBJECT TO USE BY EXISTING PRIORITY RIGHTS.

APPROPRIATING BY-PRODUCT WATER FOR BENEFICIAL USE

- WHEN APPROPRIATING BY-PRODUCT WATER FOR BENEFICIAL USE, A FORM UW 5 MUST BE FILED
- THE FORM PROVIDES AN OPTION FOR “INDUSTRIAL” USE: USE OF WATER TO MANUFACTURE A PRODUCT OR PRODUCE OIL, GAS, OR OTHER MINERALS. (OIL FIELD WATER FLOOD OPERATIONS, POWER PLANT WATER SUPPLY, ETC.).

WHEN IS A PERMIT REQUIRED TO APPROPRIATE GROUNDWATER?

- A PERMIT FROM SEO IS REQUIRED WHEN WATER WILL BE PUT TO A BENEFICIAL USE. WYO. STAT. ANN. § 41-3-930.
- TO DRILL A CBM WELL, A PERMIT IS REQUIRED BECAUSE THE DRILLING OF THE CBM WELL IS CATEGORIZED AS A BENEFICIAL USE OF WATER. STATE ENGINEER'S OFFICE, GUIDANCE: CBM/GROUND WATER PERMITS.
- WHEN DRILLING OTHER TYPES OF OIL AND GAS WELLS THAT PRODUCE WATER AS A BY-PRODUCT, A PERMIT IS ONLY REQUIRED WHEN THAT WATER WILL BE PUT TO A BENEFICIAL USE. WYO. STAT. ANN. § 41-3-904.
- HOWEVER, IT ALSO FOLLOWS THAT IF A PERSON INTENDS TO ACQUIRE THE RIGHT TO A BENEFICIAL USE OF UNDERGROUND WATER *BEFORE* DRILLING THE OIL OR GAS WELL, A PERMIT WILL BE REQUIRED PRIOR TO DRILLING. WYO. STAT. ANN. § 41-3-930.

PENNSYLVANIA WATER OWNERSHIP

- THE PEOPLE HAVE A RIGHT TO CLEAN AIR, PURE WATER, AND TO THE PRESERVATION OF THE NATURAL, SCENIC, HISTORIC AND ESTHETIC VALUES OF THE ENVIRONMENT. PENNSYLVANIA'S PUBLIC NATURAL RESOURCES ARE THE COMMON PROPERTY OF ALL THE PEOPLE, INCLUDING GENERATIONS YET TO COME. **AS TRUSTEE OF THESE RESOURCES, THE COMMONWEALTH SHALL CONSERVE AND MAINTAIN THEM FOR THE BENEFIT OF ALL THE PEOPLE.**

COMMON LAW REGARDING GROUNDWATER

- WATERS THAT ARE NOT FLOWING IN DEFINED CHANNELS AND ARE STORED BENEATH THE SURFACE OF THE LAND ARE CONSIDERED “PERCOLATING WATERS”. PENNSYLVANIA FOLLOWS THE “AMERICAN RULE”, WHICH HOLDS THAT A LANDOWNER MAY WITHDRAW PERCOLATING WATERS BENEATH HIS LAND FOR “NATURAL AND ORDINARY” USES LOCATED ON THAT LAND REGARDLESS OF CONSEQUENCES TO HIS NEIGHBORS. UNLIKE SURFACE WATER DEFINITIONS, “NATURAL AND ORDINARY USE” INCLUDES DOMESTIC WATER USE, MINING, IRRIGATION, AND MANUFACTURING. LIABILITY CAN ONLY ARISE WHERE WITHDRAWAL IS MALICIOUS, NEGLIGENT, OR CAUSES FORESEEABLE HARM TO ADJACENT LANDS. WHEN DRAWING WATER FOR USES OFF OF THE LAND OF ORIGIN, THE USES ARE NOT CONSIDERED “ORDINARY AND NATURAL”. AT COMMON LAW THESE OFF LAND USES WERE CONSIDERED UNLAWFUL AND UNREASONABLE. HOWEVER THE PENNSYLVANIA SUPREME COURT MODIFIED THE RULE BY ALLOWING TRANSFER OF WATER FOR PUBLIC NEED.

58 PA. STAT. AND CONS. STAT. ANN. § 3203 – WATER SOURCE DEFINITION

- (1) ANY OF THE FOLLOWING:
 - (I) WATERS OF THIS COMMONWEALTH.
 - (II) A SOURCE OF WATER SUPPLY USED BY A WATER PURVEYOR.
 - (III) MINE POOLS AND DISCHARGES.
 - (IV) ANY OTHER WATERS THAT ARE USED FOR DRILLING OR COMPLETING A WELL IN AN UNCONVENTIONAL FORMATION.
- (2) THE TERM DOES NOT INCLUDE FLOWBACK OR PRODUCTION WATERS OR OTHER FLUIDS:
 - (I) WHICH ARE USED FOR DRILLING OR COMPLETING A WELL IN AN UNCONVENTIONAL FORMATION; AND
 - (II) WHICH DO NOT DISCHARGE INTO WATERS OF THIS COMMONWEALTH.

REUSE OF PRODUCED WATER

- WHAT ARE THE REQUIREMENTS UNDER THE WMP FOR OPERATORS WHO RECYCLE PRODUCED AND FLOW-BACK WATER IN FUTURE WELLS? WHAT IF PRODUCED WATER IS SHARED WITH OTHER OPERATORS AS A SOURCE?
 - A DEP APPROVED WMP IS REQUIRED WHEN A PERSON WITHDRAWS OR USES WATER FROM WATER SOURCES WITHIN THIS COMMONWEALTH TO DRILL OR COMPLETE AN UNCONVENTIONAL GAS WELL. ACCORDING TO THE DEFINITION OF “WATER SOURCE” IN SECTION 78A.1, FLOWBACK OR PRODUCTION WATERS THAT ARE USED FOR DRILLING OR COMPLETING A WELL IN AN UNCONVENTIONAL FORMATION OR THAT DO NOT DISCHARGE TO THE WATERS OF THE COMMONWEALTH ARE NOT CONSIDERED AS WATER SOURCE. ACCORDINGLY, FLOWBACK WATER USED IN FUTURE WELLS OR PRODUCED WATER SHARED WITH OTHER OPERATORS WOULD NOT NEED AN APPROVED WMP FROM DEP.

OHIO – THE PROPERTY RIGHT IN GROUNDWATER

- AN OHIO LANDOWNER HAS A PROPERTY RIGHT IN GROUNDWATER ONLY TO THE EXTENT HE ACTUALLY USES THAT WATER; HE HAS NO PROPERTY INTEREST IN THAT WATER SIMPLY BECAUSE IT RESIDES BENEATH HIS LAND. SEE *WOOD V. AM. AGGREGATES CORP.*, 67 OHIO APP.3D 41, 585 N.E.2D 970, 972 (1990) (“ONE DOES NOT ACQUIRE TITLE TO UNDERGROUND WATER BUT RATHER A RIGHT TO USE A REASONABLE AMOUNT SO LONG AS NEIGHBORING LANDOWNERS ARE NOT UNDULY PREJUDICED.”). THUS, UNDER OHIO LAW, THE PROPERTY INTEREST IN GROUNDWATER IS USE-BASED, NOT TITLE-BASED. SEE *SMITH V. SUMMIT CNTY.*, 131 OHIO APP.3D 35, 721 N.E.2D 482, 486 (1998) (“NO LANDOWNER IN OHIO ... HAS EVER HELD TITLE TO GROUND WATER.”). AND HERE, IT IS UNDISPUTED THAT PLAINTIFFS NEVER USED OR PLANNED TO USE THE GROUNDWATER.

REGULATION OF PRODUCED WATER IN THE OHIO RIVER BASIN OR LAKE ERIE BASIN

- OHIO'S RECENTLY ENACTED OIL AND GAS LEGISLATION, SENATE BILL 315 (SIGNED INTO LAW ON JUNE 11, 2012), ADDS WATER USE RELATED REQUIREMENTS TO THE APPLICATION PROCESS FOR NEW OIL AND GAS WELLS. THE LAW CALLS FOR IDENTIFICATION “OF EACH PROPOSED SOURCE OF GROUND WATER AND SURFACE WATER THAT WILL BE USED IN THE PRODUCTION OPERATIONS OF THE WELL,” INCLUDING: (1) IF THE WATER WILL BE WITHDRAWN FROM THE LAKE ERIE WATERSHED OR THE OHIO RIVER WATERSHED; (2) THE PROPOSED ESTIMATED RATE AND VOLUME OF THE WATER WITHDRAWAL FOR THE PRODUCTION OPERATIONS; AND (3) THE ESTIMATED VOLUME OF RECYCLED WATER TO BE USED. THESE REQUIREMENTS WILL FACILITATE COMPLIANCE WITH THE WITHDRAWAL, CONSUMPTIVE USE AND DIVERSION RULES DESCRIBED ABOVE APPLICABLE TO THE GREAT LAKES AND OHIO BASINS. MOREOVER, AS INDICATED IN GUIDANCE TO THE OIL AND GAS INDUSTRY, WELL OPERATORS MUST REMAIN COGNIZANT OF POTENTIAL LIABILITY FOR ADVERSE IMPACTS TO OTHER WATER USERS UNDER COMMON LAW PRINCIPLES, AS CODIFIED UNDER OHIO LAW.

TEXAS WATER OWNERSHIP

- TEXAS LAW STATES THAT GROUNDWATER IS A FORM OF REAL PROPERTY OWNED BY THE SURFACE ESTATE UNLESS SEVERED OR OTHERWISE RESERVED
- IN HOUSTON & TEXAS CENTRAL RAILROAD CO. V. EAST, THE TEXAS SUPREME COURT ADOPTED THE ENGLISH COMMON LAW RULE OF ABSOLUTE OWNERSHIP AND HELD THAT THE SURFACE ESTATE OWNER POSSESSES THE ABSOLUTE RIGHT TO CAPTURE AND SELL ALL THE GROUNDWATER HE CAN PUMP FROM BENEATH HIS PROPERTY, DESPITE NEGATIVE CONSEQUENCES TO HIS NEIGHBORS.
- IN THE CONTEXT OF OIL AND GAS OPERATIONS, SURFACE OWNERS FACE A SUBSTANTIAL LIMITATION IN THAT OPERATORS WHO OBTAIN A MINERAL INTEREST ACQUIRE AN INTEREST IN A DOMINANT ESTATE. THIS MEANS THAT OPERATORS LOOKING TO DEVELOP THE OIL AND GAS RESOURCE MAY FREELY USE GROUNDWATER TO THE EXTENT REASONABLY NECESSARY TO DEVELOP THESE RIGHTS WITHOUT THE PERMISSION OF THE SURFACE ESTATE OWNER.

TEXAS – USE OF GROUNDWATER *OR WHY WE ARE HERE*

- PRODUCED WATER PUMPED FROM A WELL QUALIFIES AS “GROUNDWATER” UNDER TEXAS LAW. TEXAS LEGISLATURE DEFINES GROUNDWATER AS “WATER PERCOLATING BELOW THE SURFACE OF THE EARTH.” WATER CODE ANN. § 36.001. TX COURTS HAVE HELD THAT UNDERGROUND WATER CAPABLE OF BEING OBTAINED VIA A WELL IS “PERCOLATING.” PRODUCED WATER COMES FROM AN UNDERGROUND FORMATION AND IS OBTAINED THROUGH A WELLBORE, THUS STRONGLY SUGGESTING IT MEETS THE DEFINITION OF “PERCOLATING”.
- IF A PRODUCER TRANSFERS PRODUCED WATER TO ANOTHER PARTY FOR THE PURPOSE OF TREATING THAT WASTEWATER FOR “**SUBSEQUENT BENEFICIAL USE,**” **THE WATER BECOMES THE PROPERTY OF THE PERSON WHO TAKES POSSESSION OF IT.** HOWEVER, CHAPTER 122 DOES NOT ADDRESS IF THE PRODUCER WOULD NEED TO LIT REVENUES WITH THE SURFACE OWNER. CONTRACTUAL ARRANGEMENTS CAN CHANGE THIS THOUGH.

SPECIAL THANKS

- CHRISTINE DILLARD, WILLIAM H. BOWEN SCHOOL OF LAW CLASS OF 2019, PREPARED THE RESEARCH MATERIALS ASSOCIATED WITH THIS PRESENTATION
- THE WYOMING STATE ENGINEER'S OFFICE AND OIL AND GAS COMMISSION WERE BOTH VERY GRACIOUS WITH THEIR TIME IN ANSWERING QUESTIONS ABOUT THE WYOMING SYSTEM
- THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTIONS WAS SIMILARLY GRACIOUS

QUESTIONS?



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