Chesapeake Energy
Marcellus Shale Development

Chesapeake ENERGY

Now is the Right Time for Natural Gas

CLEAN

– **Emits 2/3 less emissions than gasoline; 1/3 less GHG's***

ABUNDANT

– **The latest numbers show our current reserves supplying the U.S. for ~118 years**

(Navigant Consulting Study 2008 – American Clean Skies Foundation)

AFFORDABLE

– **CNG retails an average $2 less than gasoline**

AMERICAN

– **98% of U.S. consumption is produced in North American**

ENGTHS – In Recovery, Global Energy Demand Continue to Surge

- **By 2020, the IEA predicts oil consumption will increase 60%**
- **During that period, China's consumption of oil will increase 7.5% each year**
- **India's will increase 5.5% each year**
- **Oil at that pace could be $200/bbl by 2030**
- **To keep up with the demand, OPEC countries will have to add 64 million barrels of production per day in the next 22 years***
  - This projected growth will require **$350 billion per year** on new projects
  - OPEC only spent $390 billion on new projects from 2000-2007

ENGTHS – A Century of Abundant
ral Gas Supply Has Been Confirmed

. Total Gas Supply Resource Base (Tcf)

500
000
500
000
500
0

2006 Potential Gas Committee Supply Estimate
(82 Years' Supply at 2006 Production Levels)

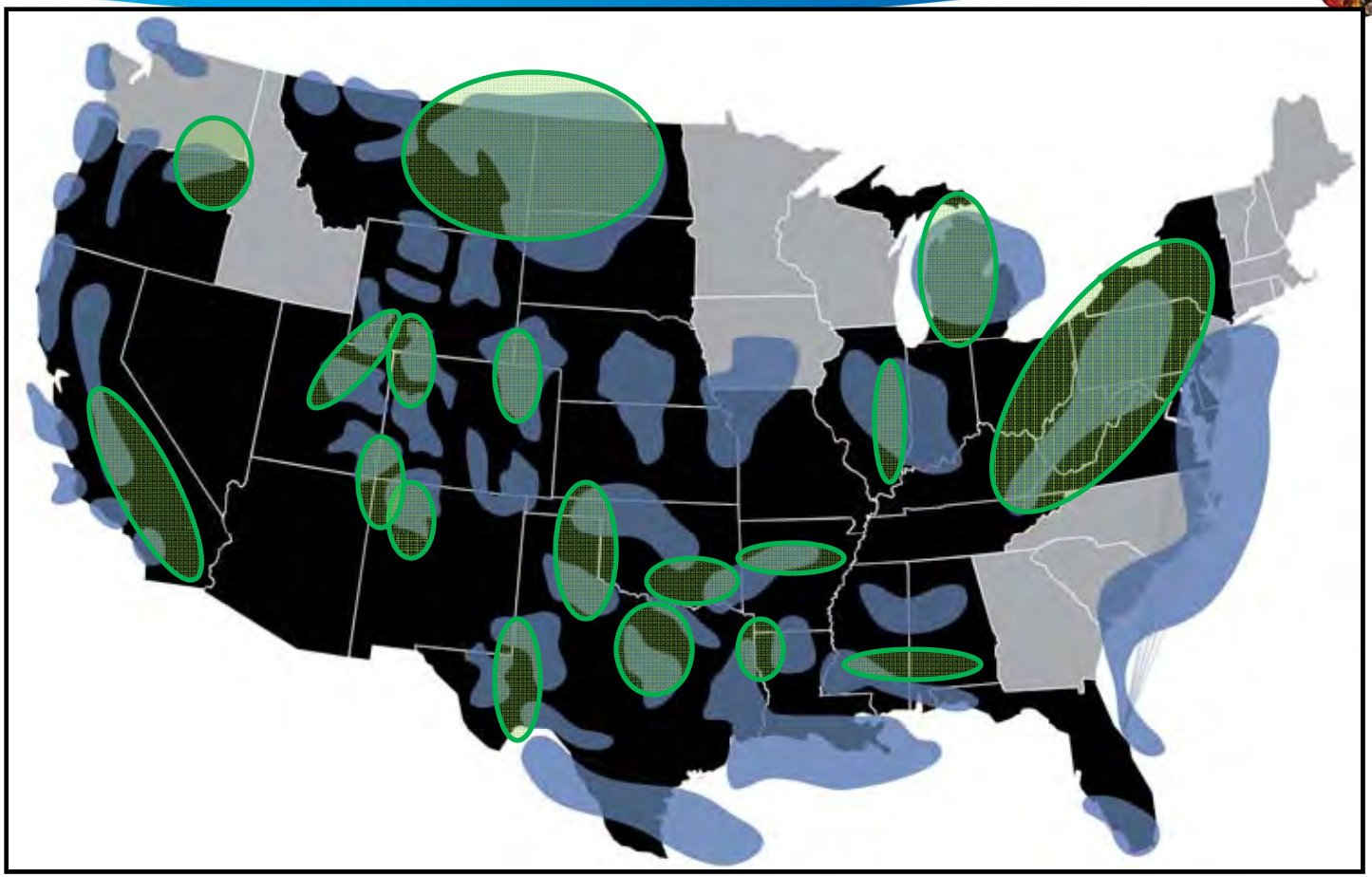
Already 20% greater than the 2004 report

2008 NCI Supply Update of PGC Supply Estimate, Inclusive of Shale Assessment
(88 Years' Supply at 2007 Production Levels)
10% Increase over Column 1

2008 NCI Supply Update Adjusted for Industry Input (Maximum as of June 2008)
(118 Years' Supply at 2007 Production Levels)
47% Increase over Column 1

Proved Reserves
Unproved Technically Recoverable Resource

ENGTHS – Extraordinary Natural Gas
osits Have Been Discovered Across the U.S

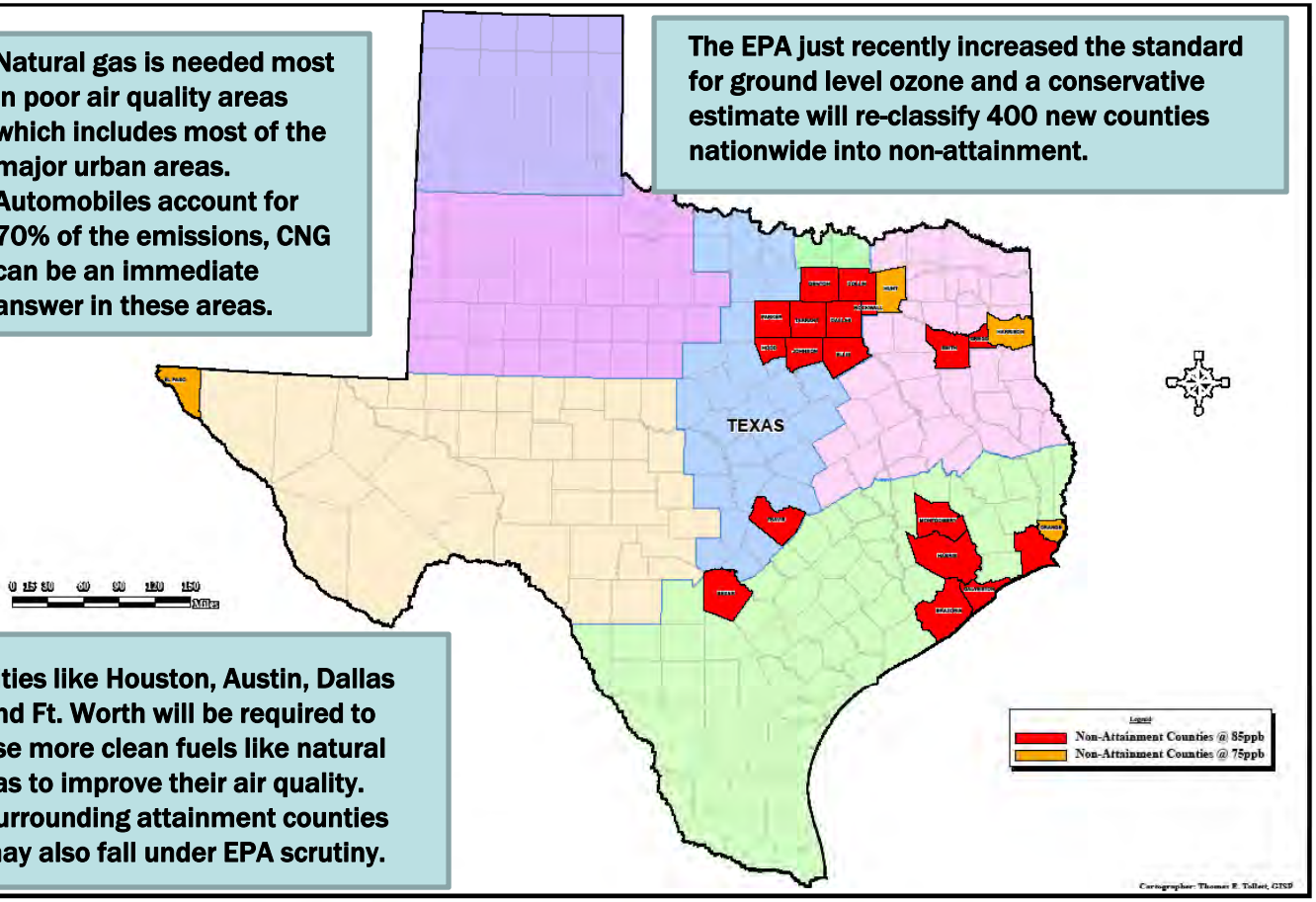


Conventional Formations
Unconventional Formations

ENGTHS – Using Natural Gas Can uce Emissions

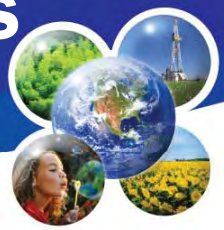
Natural gas is needed most in poor air quality areas which includes most of the major urban areas. Automobiles account for 70% of the emissions, CNG can be an immediate answer in these areas.

The EPA just recently increased the standard for ground level ozone and a conservative estimate will re-classify 400 new counties nationwide into non-attainment.

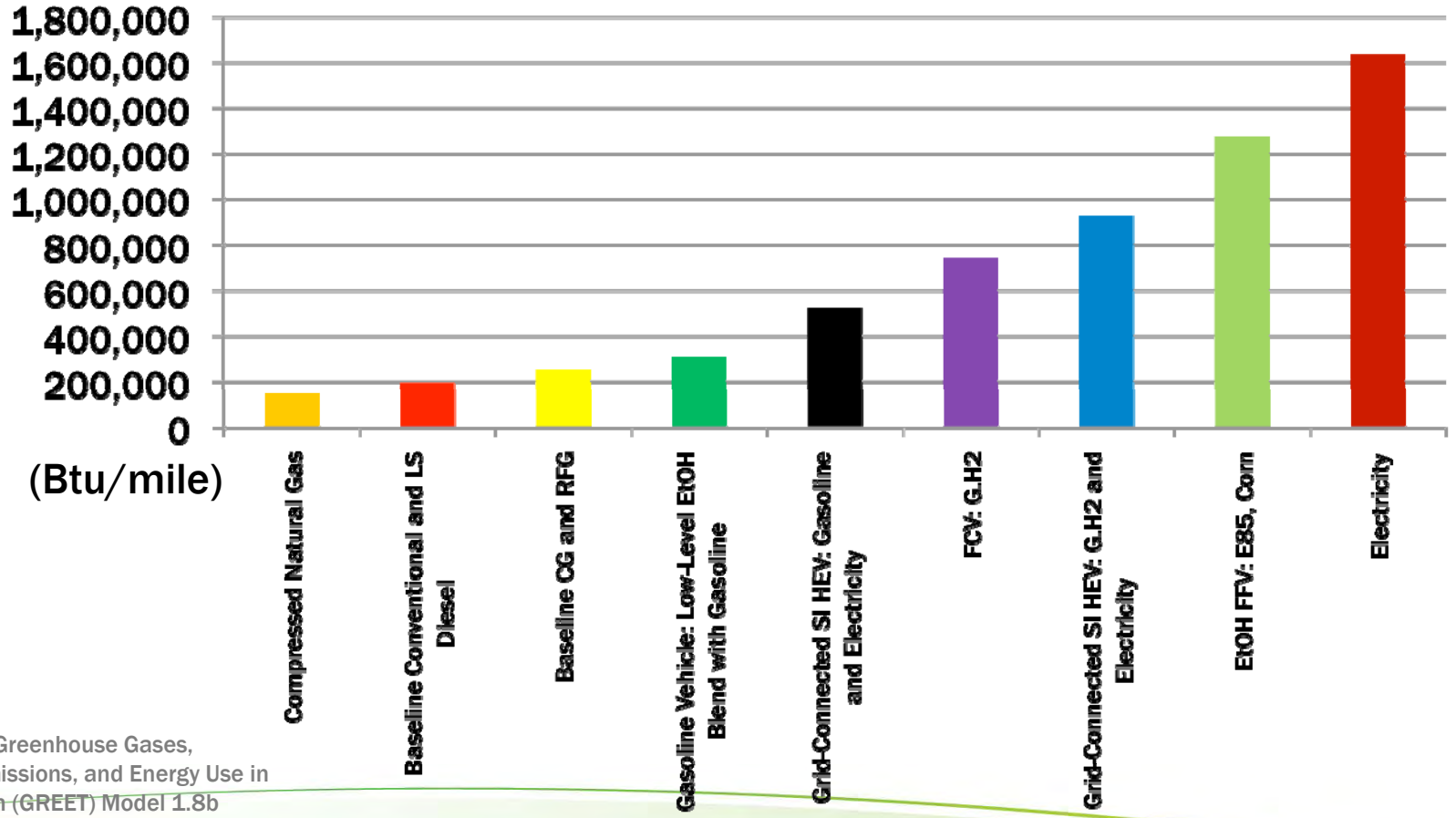


Cities like Houston, Austin, Dallas and Ft. Worth will be required to use more clean fuels like natural gas to improve their air quality. Surrounding attainment counties may also fall under EPA scrutiny.

ENGTHS –Efficient Consumption Process
ns Less Total Emissions



Well to Wheels" Total Energy Consumption of Select Alternative Fuel Choices



e Greenhouse Gases,
missions, and Energy Use in
on (GREET) Model 1.8b

Time for Stimulating Demand Growth is NOW!

- **Our country is faced with a challenging economic environment**
  - Natural gas production is an economic development driver
  - Keep capital in U.S. plus creates new jobs
- **Our nation's energy policy is going to be a top priority**
  - Natural gas is the best energy answer – Clean, American, Affordable, Abundant,
- **2009 is the start of a new energy/environment linkage administration in Washington**
  - Obama recognizes the many benefits of natural gas
  - Obama's new Chief-of-Staff Rahm Emanuel is an advocate of CNG and author of supportive legislation
  - Clinton Administration favored natural gas demand, so should Obama's
- **Carbon regulation will be one of Obama's first initiatives**
  - Natural gas is the cleanest traditional fuel
- **Natural Gas is increasingly recognized to be clean and abundant**
  - Natural gas will continue to be a stable energy option for American consumers

y's Objective: A Call to Arms

HE ISSUES:

ur industry has -

- Cracked the code in developing significant new reserves of natural gas from unconventional formations in the U.S. and Canada
- Brought this new production on just as the U.S. economy has significantly weakened and may weaken further in 2009
- Never embarked on a serious public opinion campaign to increase demand for its product
- A clean, green, renewable-compatible domestic alternative for U.S. consumers.
- Use less energy per unit of output and use a lot more of our own
- There is indeed plenty of market for all U.S. Energy Sources if we back out foreign sources

sapeake Energy

- Number 1 Natural Gas Driller in the Nation
- Exceptional Drilling Success Rate – 98%
- The Largest Independent Producer of Natural Gas
- Exclusively Onshore and Domestic
- Exclusively Focused on Natural Gas
- Growth through Drill Bit and Acquisitions
- Founded in 1989 NYSE: CHK

conventional Natural Gas Development
ale Gas

t is Shale Gas?

Gas is found in
anic-rich Sedimentary
ks (Shales) that were
ginally Deposited as
ds within Tidal Flats
Deep Water Basins

e Shales have Low
meability and Typically
quire a Combination of
izontal Drilling and
raulic Fracturing for the
to be Released in
nomic Quantities

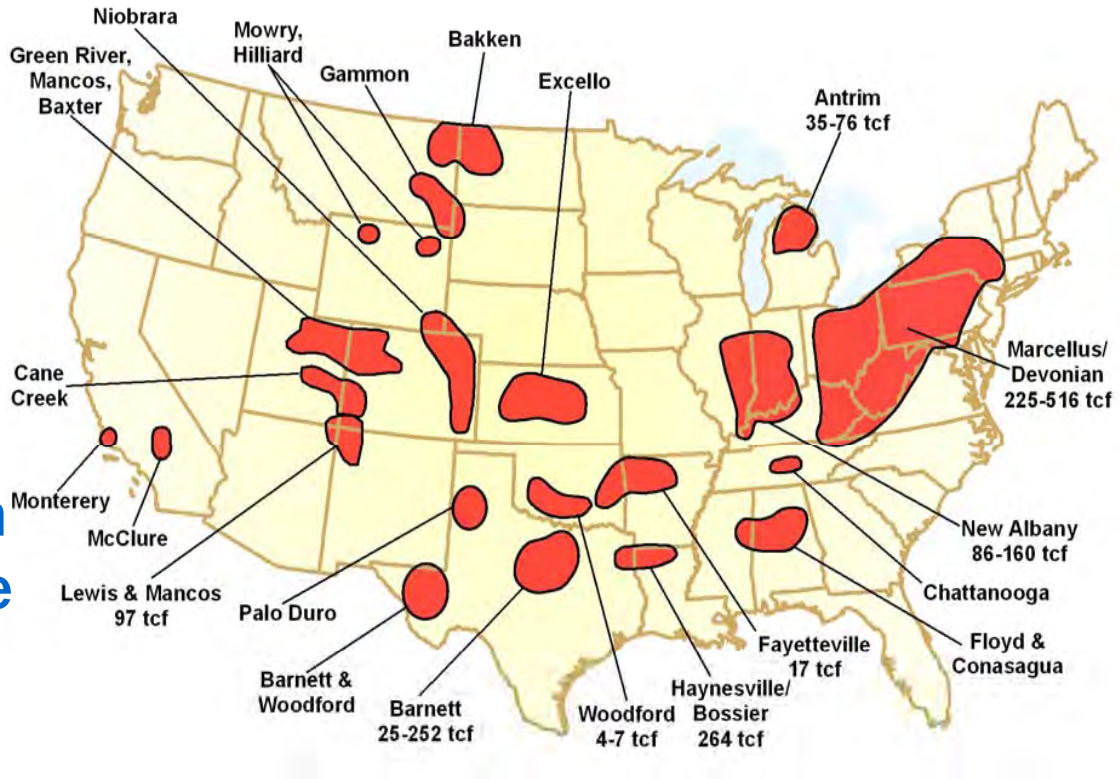
Marcellus Shale Outcrop in Pennsylvania

Source ALL Consulting, 2008

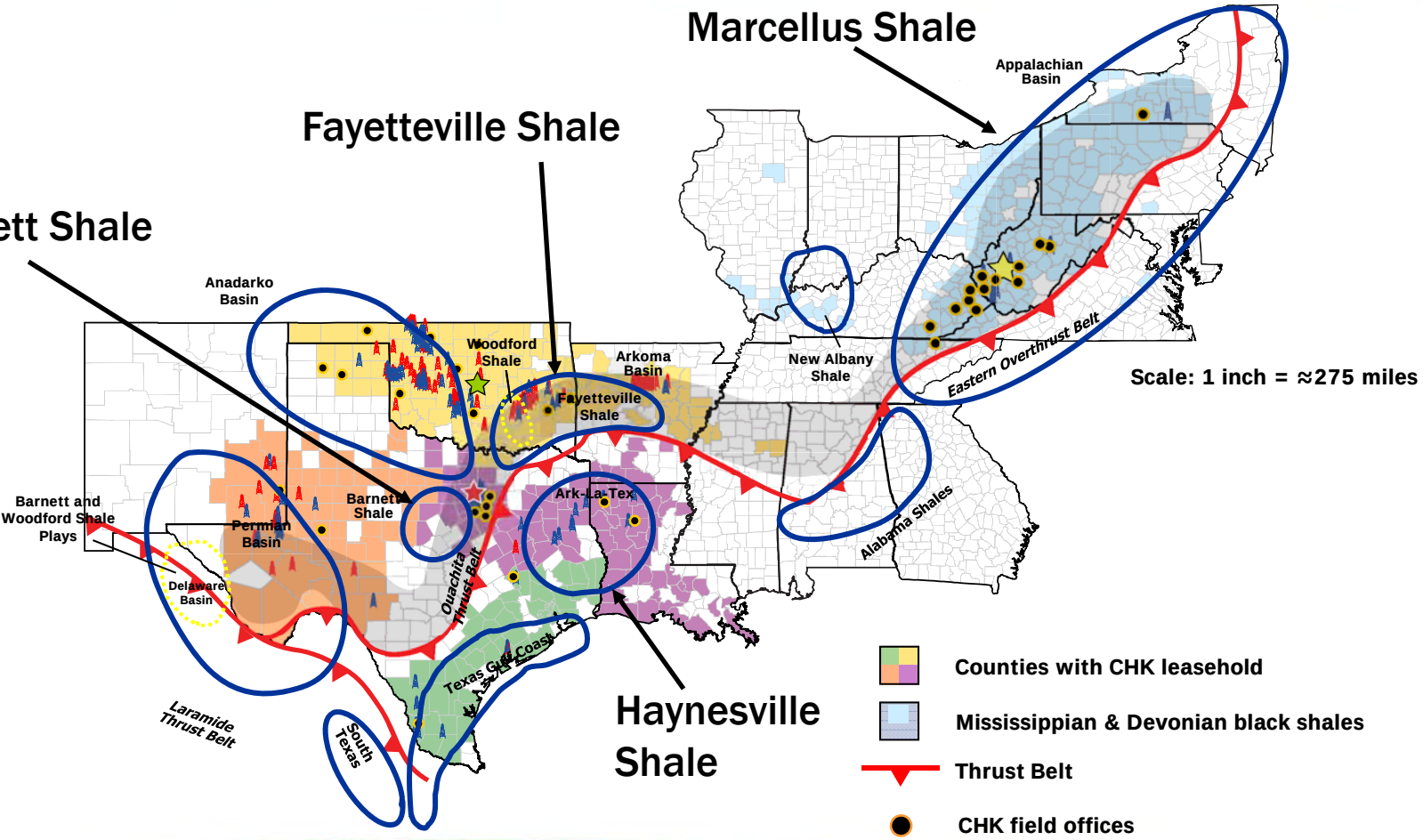
le Gas Distribution

e Gas is Found
oughout the Eastern,
uthern and West-
ntral parts of the
untry within Major
limentary Basins

k Shales within the
palachian Basin, such
the Marcellus, are the
mary Focus of Shale
s Development in
nnsylvania



sapeake Energy Corporation



duction Process

There are Five Basics Steps in the Production Process:

1. Site Selection and Well Pad Preparation
2. Drilling the Well
3. Completing the Well
4. Marketing the Gas
5. Reclaiming the Site

Selection

Site Selection – A Number of Factors are Considered in Selecting a Drilling Site

- Favorable Geology
- Topography
- Access Roads
- Routes for Pipelines and Utilities
- Proximity to Schools or Residential Areas
- Environmental Factors such as Wetlands and Sensitive Wildlife Habitat
- Available Water Source(s)

Pad Preparation

Well Pads can be Located in Rural or Urban Areas

- Pad Preparation Requires Approximately One to Three Weeks
- Typically Requires 1 - 3 Acres to Construct

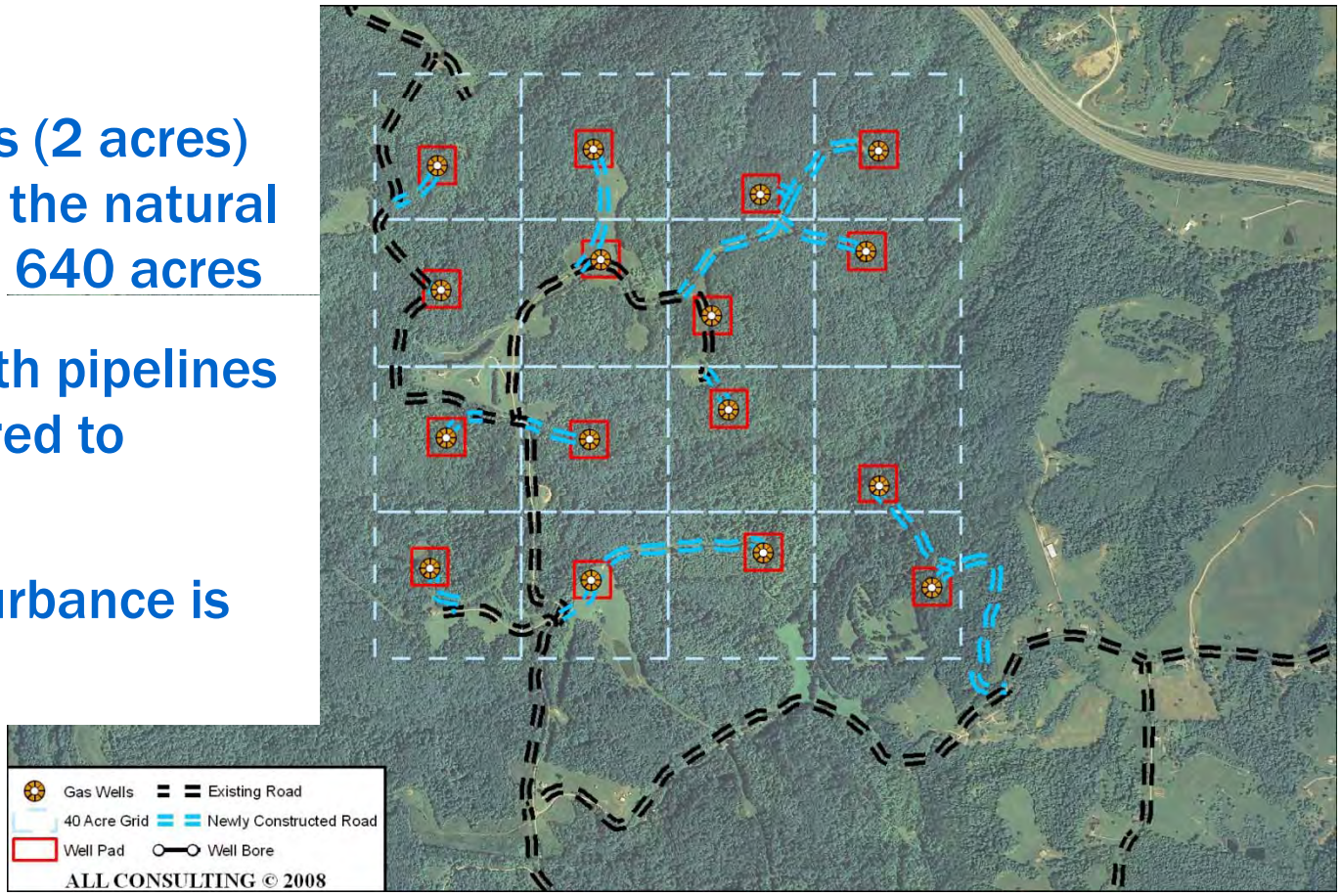
ical Drilling – Multiple Well Pads

cal Wells

to 16 Well pads (2 acres)
ded to recover the natural
resource from 640 acres

tiple Roads with pipelines
utilities required to
ess the wells

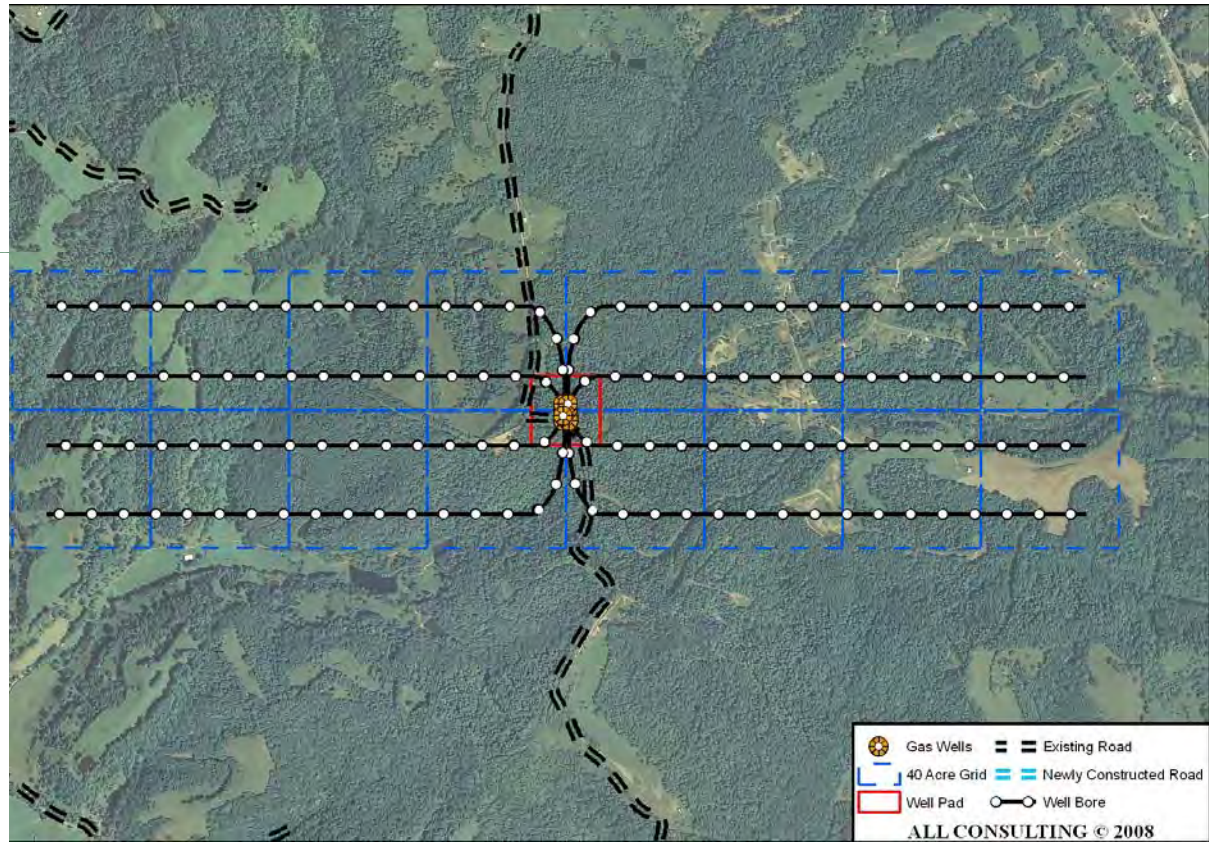
al surface disturbance is
5 acres



zontal Drilling - Reduced Footprint

ontal Wells

- o 8 Horizontal Wells
  ticipated drilled from
  ch 1 to 3 acre pad
- e Road with pipeline
  d utilities to well pad
- proximately 85%
  ss surface
  turbance than
  source Recovery with
  rtical Wells

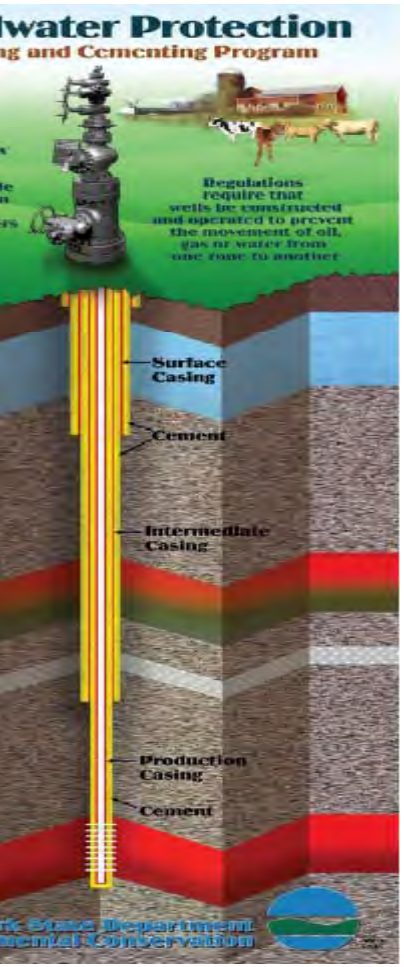


zontal Well Pad
Rig #240 – Victory Prospect

Horizontal Well Drilled in Northern West Virginia

Well Pad can Accommodate 6 to 8 Horizontal Wells

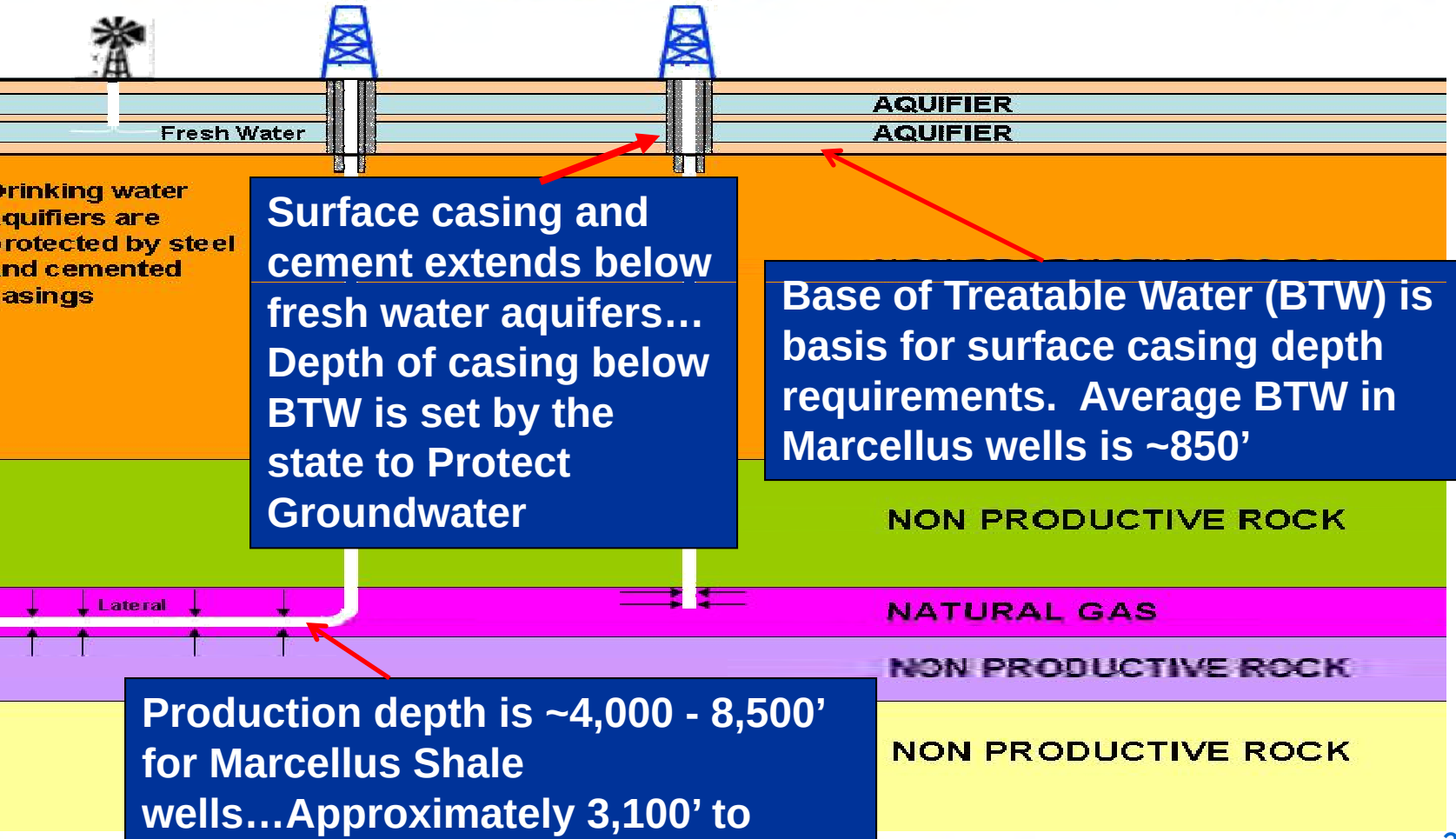
ing the Well - Groundwater ection



Five or more Layers of Protection are installed in the Well to Isolate the Well Bore from its Surroundings and Protect Groundwater and the Environment

- Surface Casing
- Cement, sealing the Surface Casing in Place
- Production Casing
- Cement, sealing Production Casing in Place
- Production Tubing
- On some Wells, an Additional String of Casing and Cement (Intermediate Casing) is installed

undwater Protection
cellus Shale

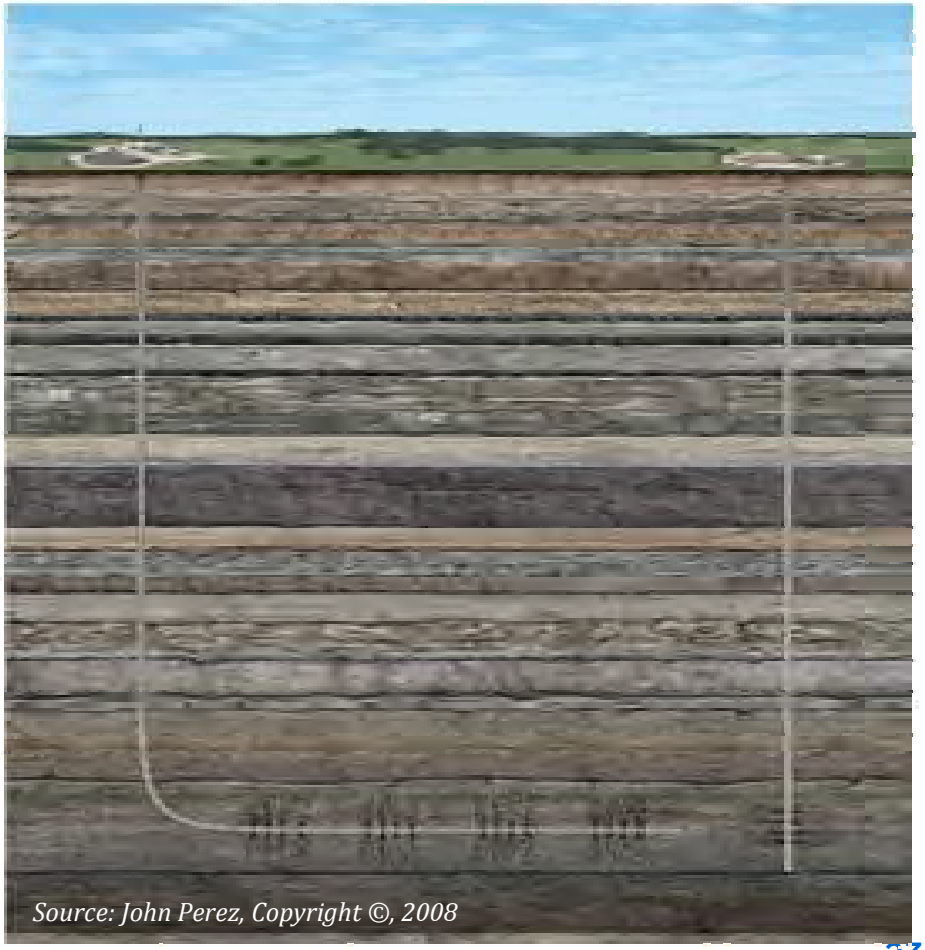


ing the Well – Horizontal Wells

puter-Driven, State-of-
e-Art Technology allows
r Horizontal Drilling

orizontal Drilling allows for
ccess to a Greater Volume
the Shale Gas Reservoir

ccess to a Greater Volume
the Reservoir makes
nale Gas Development
conomic



Source: John Perez, Copyright ©, 2008

ing the Well – Good Neighbor

orizontal Drilling allows
nergy Companies to
void Homes and Schools
y Drilling from a Mile, or
nore, away

Where Avoidance is Not
ossible, Measures can be
nplemented to Reduce
isturbances due to
rilling Activities such as
oise and Lighting

raulic Fracturing

the Rig leaves, Hydraulic acturing ("Fracing") Begins

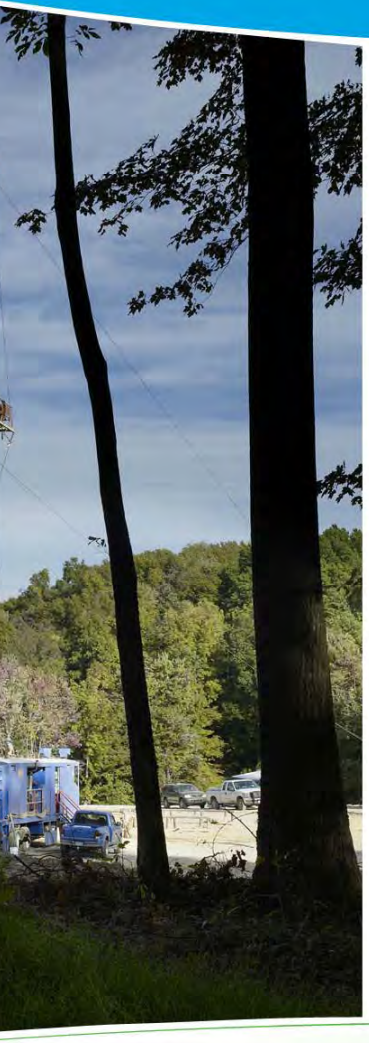
acing is a Process to **Stimulate tural Gas** from the Hard Shale

ater is Mixed with Proppant ch as Sand or Bauxite) and mped into the Shale Reservoir der High Pressure

s Process Fractures the Shale Release the Gas

veral Days to Complete... Only nducted during Daylight Hours

cal Fracture Fluid Make-up



Common Fracture Mixtures are made up of greater than 85% Water by Weight (including weight of the sand proppant) and are **98% or more Water** by Volume (sand proppant not included).

The Additives that are incorporated to Control corrosion, reduce friction, Prevent bacterial growth, etc. represent approximately **2% or less** of the mixture.

er Resource Planning and Estimated for the Marcellus Shale

velopment area

- Establish extent of play
- Evaluate Hydraulic/hydrogeologic connectivity
- Establish baseline data and projected water use

mpile data on water users

ater resource data

- Surface water and availability
- Wastewater discharges
- Produced water quality

fine regulatory structure

entify opportunities

Estimated Water use by Chesapeake for the Marcellus Shale Area

2,000 BBLS used for Drilling
60,000 BBLS used for Fracturing **

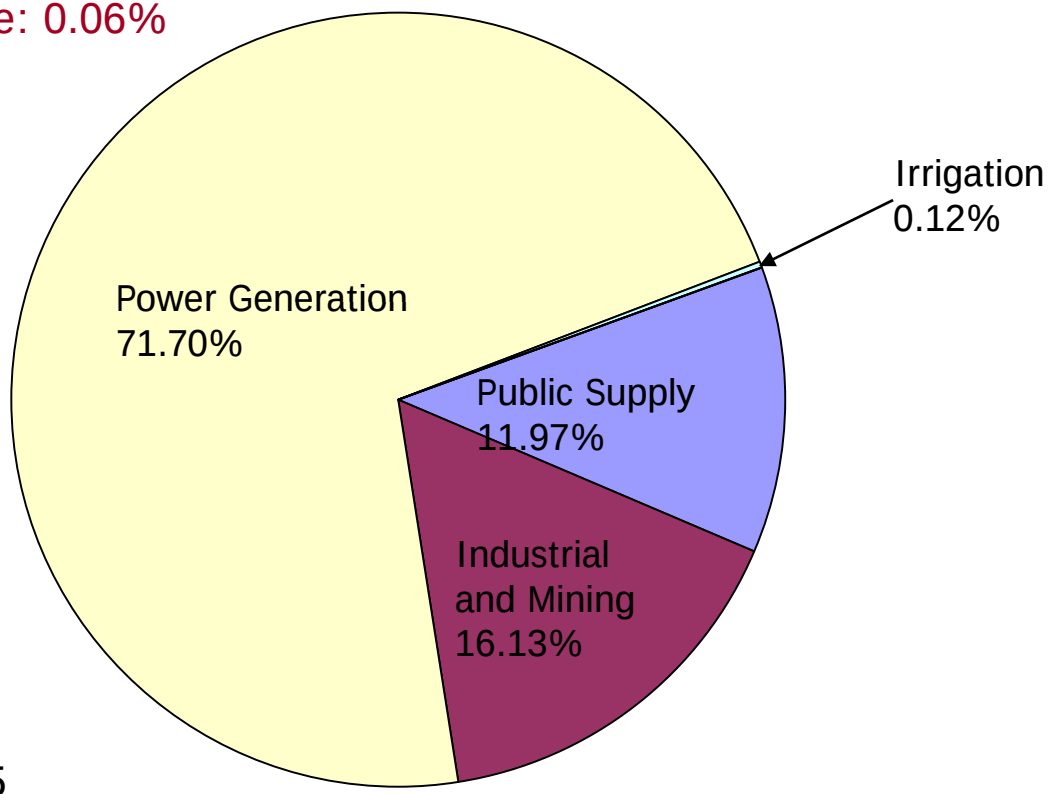
62,000 Total BBLS Used

CHK Projected Wells per Year: 700*
Projected Total Water Use per Year:
43 Million BBLS

er use in Marcellus Shale Area

Water Use (Surface Water and Ground Water) in Central PA (32 County , Southern NY (10 County Area), Northern WV (29 County Area), Western nd MD (5 County Area), and Eastern OH (3 County Area) by Sector

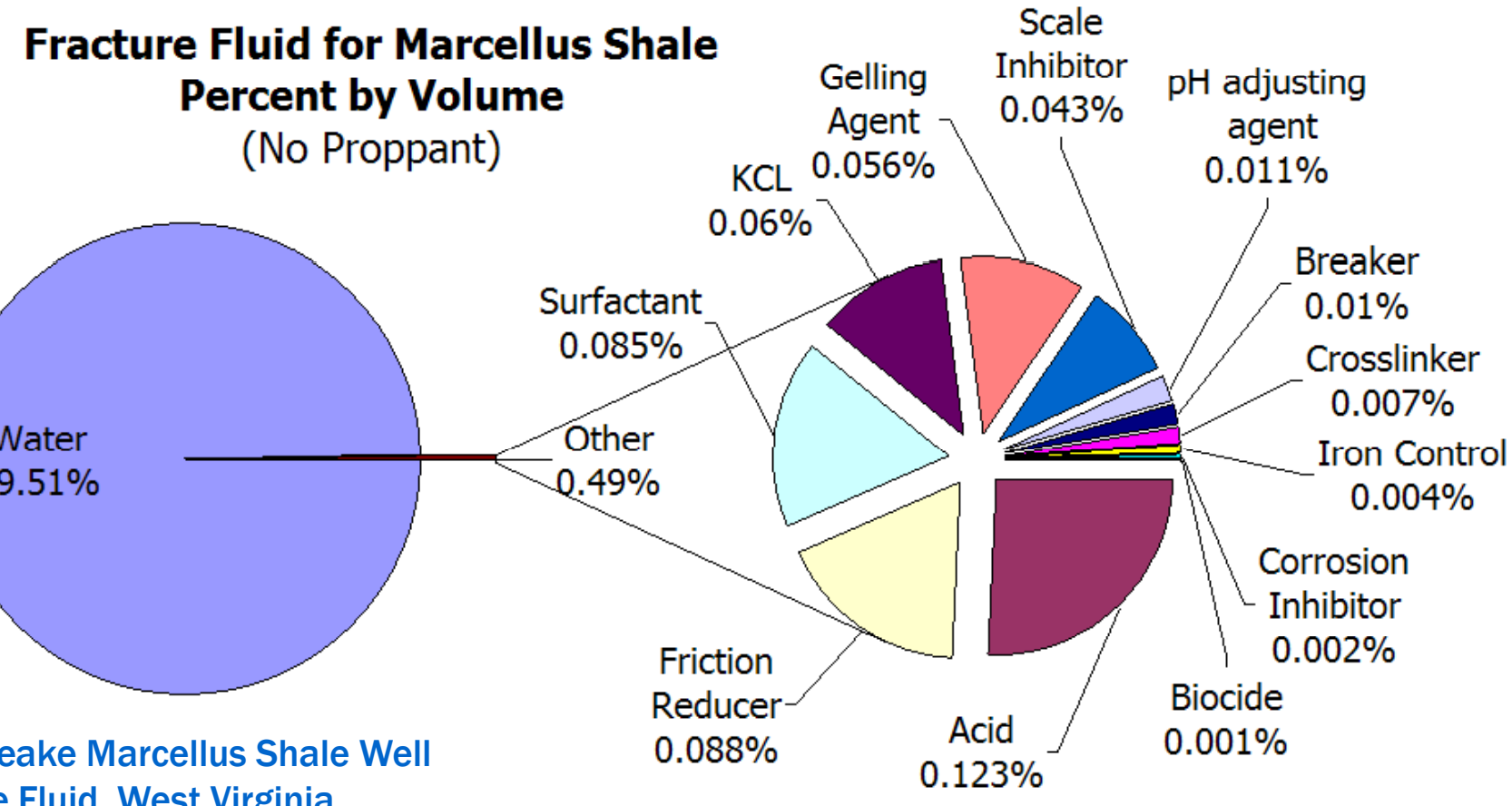
Notable Other Uses (too small to show on chart):
CHK Projected Use: 0.06%
Livestock: 0.01%



Total Water Use in Marcellus Area: 85

Source: USGS Estimated Use of Water in US,

cal Fracture Fluid Make-up



eake Marcellus Shale Well
e Fluid, West Virginia

er Management - Flowback Water

peake Marcellus Shale Well, West Virginia

Flowback Water consists of the Initial Water that is returned to the surface after Hydraulic Fracturing is completed. Consists of Frac Make-up Water combined with Natural Formation Water with a higher TDS.

Flowback Water is piped to Steel Frac Tanks onsite and transported offsite for Treatment or Disposal in Permitted Class II Wells.

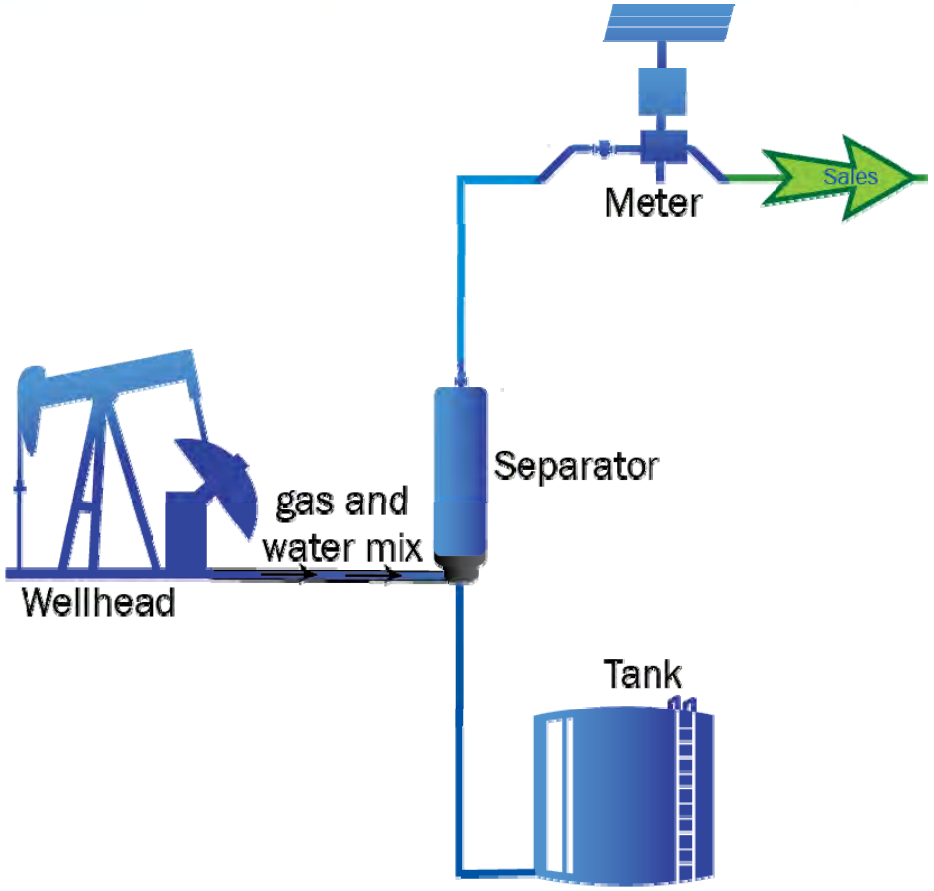
er Management– Produced Water

- Onsite Tanks are used to Store Produced Water
- Produced Water is Naturally Occurring Water found in the Shale Formation…It Typically has a High Chloride Content requiring either Treatment or Disposal in a Permitted Class II UIC Well.
- Berms and Containment Structures are used to Contain any Release of Produced Water

duction/On-going Operations

oduction to Sales

- Well is completed
- Connected to sales line
- Gas and fluids reach surface
- Gas and fluids are separated by the “Separator”
- Gas travels thru sales meter to pipeline
- Pipeline carries gas to market
- Fluids are retained on location in tanks until removed via pipeline or truck



aiming the Site

Site is reclaimed and landscaped

Install appropriate permanent fencing as needed

Energy company returns regularly to:

- Maintain equipment
- Monitor production rate

WORKFORCE CHALLENGES AND ORTUNITIES

- Drillers
- Drilling & Service Rig Hands
- Oil Field Truck Drivers
- Oil Field equipment operators
- Geologists and geophysical staff
- Production workers (pumpers and well tenders)
- Engineers
- Landmen
- Lobbyists
- Lawyers
- Accountants

Compressed Natural Gas (CNG)

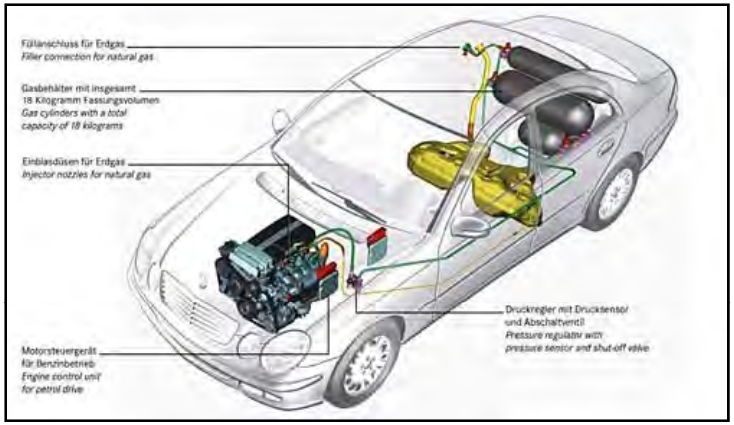
Natural Gas is America's Own Energy Answer

HE TIME FOR CLEAN FUELS

ar, Wind, and Natural Gas (Including Natural Gas Vehicles) are what the U.S. needs to turn back the clock on GHG emissions and reduce our dependence on foreign oil

CNG – The Basics

- Utility quality gas
- Compressed at 3000 – 3600 psi
- 130 octane
- Comparable performance
- Can power both heavy and light-duty vehicles
- Used since World War II



Natural Gas Can Be Ramped Up Now - No 10 Year Wait!

the United States increased its usage of NGV vehicles 00x (10-15 million vehicles), US natural gas demand would only increase 4%

Calculation: (1 Mcf = 8 gallons equivalent)

Average gallon usage of fuel per car per year: **700 gallons**

New implementation of vehicles: **10 million vehicles**

Annual fuel usage of 10 million natural gas vehicles: **7 Billion gallons (875 Bcf)**

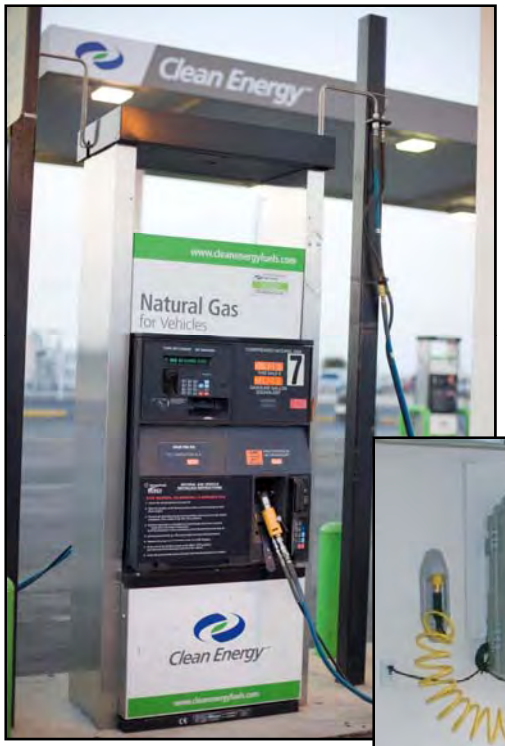
Annual consumption for NGVs at 10 million vehicles: **2.3 Bcf**

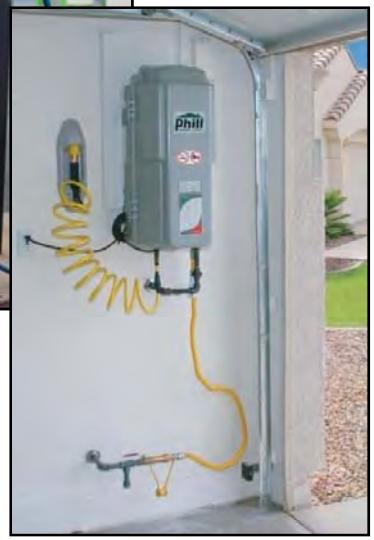
Annual consumption of natural gas in the United States (2007): **23 Tcf**

Source: Southern Counties of Governments and the National Automobile Dealers Association

Obstacles

- Fueling Infrastructure
- Vehicles/conversions
- Misconceptions/misinformation
- Awareness





What Our Leaders Can Do

Work with the schools and government fleets to use CNG

Pass prudent legislation to encourage CNG's adoption

ncentivize fueling infrastructure

ncentivize vehicle conversion

Learn more about alternative fuels

10 CNG Users by Country

		CNG VEHICLES	STATIONS	NGVs / STATION
1	Argentina	1,650,000 (12%)	1,400	**1,180**
2	Pakistan	1,550,000 (54%)	1,606	**965**
3	Brazil	1,425,513 (26%)	1,442	**988**
4	Italy	432,900 (12%)	558	**775**
5	India	334,820 (34%)	321	**1,043**
6	Iran	263,662 (82%)	179	**1,472**
7	Colombia	203,292 (65%)	310	**655**
8	USA	146,876 (9%)	1,340	**109**
9	China	127,120 (24%)	355	**358**
10	Ukraine	100,000 (33%)	147	**680**

(Annual Growth Rates 2005 -2007)

is Today's Green Energy Answer

he Clean, American, Abundant, and Affordable fuel

calable quickly and affordably

roven technology and viable fuel

ehicles in all shapes and sizes can run on CNG

safe and easy to use product

he only alternative fuel that can power both heavy-duty nd light-duty vehicles efficiently

ur existing pipeline system is the basis of the delivery nfrastructure; we only lack the "last 10 feet"

M and Ford produce 18 models around the world that run n CNG, none in the U.S.

is the Answer for Tight Budgets

G provides a clean and affordable fuel for our schools,
ies, states, law enforcement and business partners

- chool Busses
- axi Cabs
- lass Transit
- overnment/Industry Fleets
- amily Vehicles
- lunicipal Heavy-Duty Vehicles

eat opportunity for new partners and
eptional third-party endorsements

Remember: 1 mmbtu provides 8 gallons of fuel, so $6.40/mmbtu

ral Gas Vehicles Scalable With Today's estic Supply

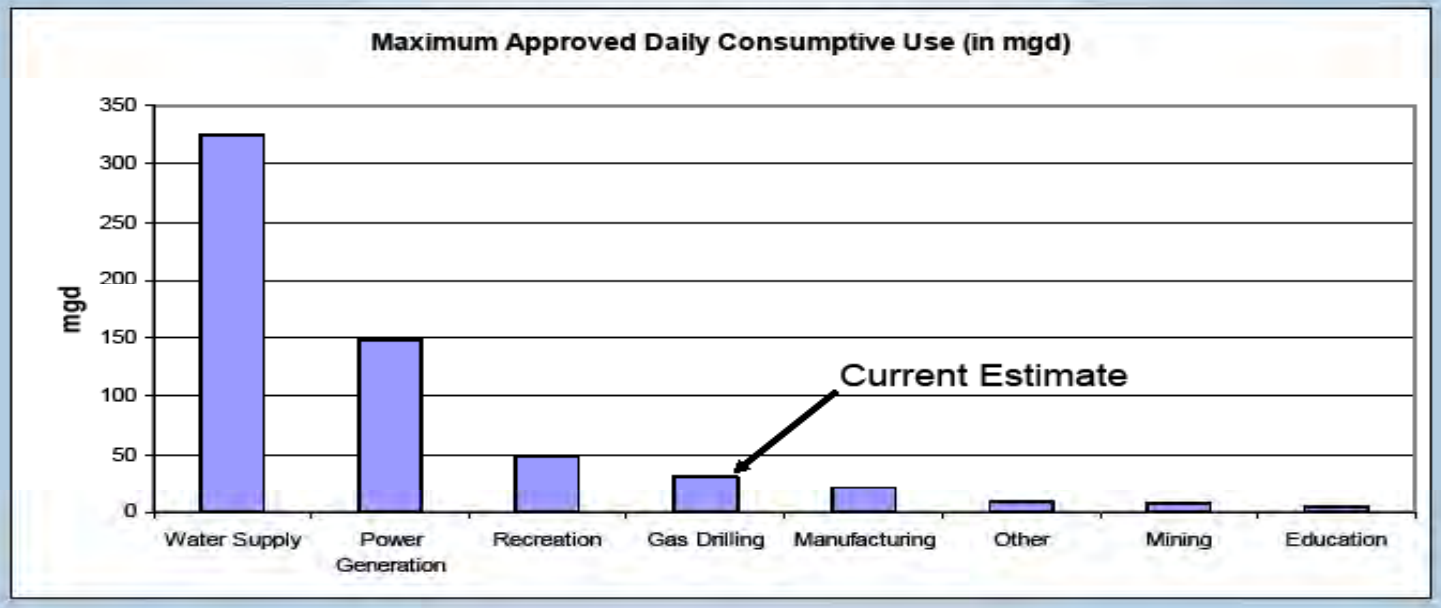
US NGVs	% of US autos	BCF/year	BCF/day	U.S. Gas Annual Demand Increase
50,000 *	0.06%	13	0.03	0. 05%
300,000	0.12%	26	0.07	0. 11%
700,000	0.3%	61	0.17	0.26%
,000,000	0.4%	88	0.24	0.38%
,000,000	2%	438	1.2	1.9%
,000,000	4%	875	2.4	3.8%
,000,000	8%	1,750	4.8	7.6%
,000,000	20%	4,375	12	19%
5,000,000	50%	10,938	30	47%

A challenging yet achievable target for the next 10 years

Consumption numbers – EIA 2007
*Current US NGV total
Based on average annual fuel demand per driver – 700 gallons & 1 mmbtu= 8 gallons of CNG fuel

er Use in the
quehanna River Basin

Maximum Approved Daily Consumptive Use



Susquehanna River Basin Commission www.srbc.net

Source: Susquehanna River Basin Commission

ENGTHS – Cleanest Organic Fuel

Natural Gas vs. Other Energy Emission Levels

OLLUTANT	NATURAL GAS	OIL	COAL
arbon Dioxide	117,000	164,000	208,000
rbon Monoxide	40	33	208
trogen Oxides	92	448	457
Sulfur Dioxide	1	1,122	2,591
Particulates	7	84	2,744
Mercury	0.000	0.007	0.016

unds per Billion Btu of Energy Input

e: www.naturalgas.org