

**DOVER D.C. SCRUTINY COMMITTEE MEETING:
11TH NOVEMBER 2013.**

SHALE GAS RECOVERY IN EAST KENT: WATER RESOURCE IMPLICATIONS.

1. REF. APPLICATIONS BY COASTAL OIL AND GAS FOR EXPLORATORY DRILLING AT GUSTON, SHEPHERDSWELL AND TILMANSTONE; AND THE THREAT TO DOVER'S WATER SUPPLY.

2. FIG 1. GEOLOGY.

SETTING THE SCENE: NOTE OUTCROP AREA OF THE CHALK (GREEN). KENT'S PRINCIPAL WATER RESOURCE, PROVIDING 70% OF THE COUNTY'S DOMESTIC AND COMMERCIAL SUPPLY (90% FOR DOVER) UNDERLAIN AT 300 – 400M BGL BY THE COAL MEASURES OF THE KENT COAL FIELD (THE PROSPECTIVE SOURCE OF SHALE GAS + COAL BED METHANE)

3. FIG 2. MAP OF APPLICATION SITES + PUBLIC SUPPLY BOREHOLES DRAWING ON THE CHALK GROUNDWATER.

NOTE:-

- WATER Co SUPPLY AREAS (PINK = AFFINITY, GREY = SEW, GREEN = SW)
- RED CIRCLES = PWS BOREHOLES
- BLACK CROSSES = APPLICATION SITES
- NOTE ALSO, CLOSE PROXIMITY OF EXPLORATORY SITES TO PWS BOREHOLES.
- MANY OF THESE COULD BE AT RISK OF CONTAMINATION BY INVASION OF TOXIC GASES AND FRACKING FLUIDS, **HOW?**

**4. FIG 3 BGS GEOL SECTION SW – NE
TILMANSTONE – WOODNESBOROUGH (DOVER SHEET 290)**

- NOTE CHALK STRATA OF N.DOWNS UNDERLAIN BY GAULT CLAY (BLUE) AND THE COAL MEASURES.
- NOTE FORMER EXPLORATORY BOREHOLES (NCB ETC)
- NOTE NUMEROUS FAULTS (PLANES OF STRUCTURAL WEAKNESS) WITH 30 – 40M DISPLACEMENT.

5. FIG 4 BOREHOLE SECTIONS. GUSTON, TILMANSTONE AND WOODNESBOROUGH.

SHOWS DETAILS OF CHALK AQUIFER AND UPPER COAL MEASURES

NOTE KENT LEVELS 1 – 14

1 TO 7 = UPPER (SANDSTONE) GROUP

7 TO 14 = LOWER (SHALE) GROUP:- THE FRACKING ZONE.

6. Fig 5 HIGH ANGLE FAULTS AND THE FRACKING ZONE.

- THE FRACKING PROCESS INVOLVES PUMPING LARGE VOLUMES OF WATER CONTAINING SAND + A MIXTURE OF (UP TO 200) CHEMICALS OF VARYING TOXICITY, UNDER HIGH PRESSURE DOWN DEEP BOREHOLES AND ALONG LATERAL EXTENSIONS INTO THE SHALE BEDS TO BREAK UP THE FORMATION AND RELEASE THE CONSTITUENT GASES (TYPICALLY METHANE).
- OUR CONCERN IS THAT THE IMPACT OF HIGH PRESSURE FLUID INJECTION COULD RE-ACTIVATE THE FAULTS AND CREATE NEW PATHWAYS FOR FLUID MIGRATION INTO THE OVERLYING CHALK AQUIFER WITH RESULTING CONTAMINATION OF THE GROUND WATER RESOURCE.

7. WHAT'S THE EVIDENCE ?

- NOTABLY WE HAVE THE BLACKPOOL EARTHQUAKES, FIRST RECORDED IN 2011 AND CONTINUING INTO SEPT OF THIS YEAR.

THESE WERE LINKED BY BGS TO LOCAL FRACKING OPERATIONS BY CUADRILLA, WHO EVENTUALLY "OWNED UP".

- ALSO, A LONG HISTORY OF METHANE CONTAMINATION OF DRINKING WATER ASSOCIATED WITH FRACKING OPERATIONS IN THE US.

TWO EXAMPLES:-

2004, UNION OF CONCERNED SCIENTISTS CITING INCIDENTS IN ALABAMA, COLORADO, NEW MEXICO VIRGINIA AND WYOMING HIGHLIGHTING EPA'S FAILURE TO PROTECT PUBLIC HEALTH

2011 S.G. OSBORN et al. DUKE UNIVERSITY DURHAM, N. CAROLINA. METHANE CONTAMINATION OF DRINKING WATER ASSOCIATED WITH GAS WELL DRILLING AND HYDRAULIC FRACTURING (DRAWING ON STUDIES IN PENNSYLVANIA AND NEW YORK)

- WE ALSO HAVE THE STUDIES BY PROF DAVID SMYTHE, FORMER CHAIR OF GEOPHYSICS AT GLASGOW UNIVERSITY; DRAWING ON DATA FROM UK AND EUROPEAN OPERATIONS.

HIS CONCLUSIONS WERE:-

"A LEAKY FAULT IS A FAST-TRACK TO THE CONTAMINATION OF SHALLOW GROUNDWATER BY SHALE GAS AND FRACKING FLUIDS"

- FRACKING IS NOW BANNED IN FRANCE AND GERMANY.

8. CONCLUSIONS.

- SHALE GAS RECOVERY IS A HIGH RISK OPERATION, WITH LASTING CONSEQUENCES FOR DOVER PWS CONSUMERS AND PUBLIC HEALTH THROUGHOUT THE WIDER E. KENT COMMUNITY. ALSO, IMPLICATIONS FOR PRIVATE WATER SUPPLIES AND IRRIGATION AS WELL AS THE LONG TERM IMPACT ON SOILS.
- ANY CONTAMINATION MUST BE REGARDED AS, FOR ALL PRACTICAL PURPOSES, IRREVERSIBLE.

- THERE ARE 25+ PWS BOREHOLES IN THE AREA OF SEARCH, AND THE LOSS OF JUST 2 OR 3 WOULD SIGNIFICANTLY DEplete PWS CAPACITY OF AFFINITY.
- AND EA HAVE ALREADY ASSESSED KENT'S WATER RESOURCES (NOV 2012) AS "SERIOUSLY STRESSED" THEREFORE INSUFFICIENT RESERVES REMAIN TO SUSTAIN THE VOLUMES REQUIRED FOR FRACKING OPERATIONS.
- EA AND KCC ARE NOW FINALISING A SPECIFICATION FOR THE PROPER CONDUCT OF DRILLING AND TESTING OPERATIONS ENVISAGED FOR THE EXPLORATORY PHASE. THIS INCLUDES MEASURES TO ENSURE ADEQUATE PROTECTION OF GROUNDWATER QUALITY AND COMPLIANCE WITH THE STATUTORY CONDITIONS GOVERNING WATER ABSTRACTION AND DISPOSAL.
IT IS CONSIDERED UNLIKELY THAT THE APPLICANTS WILL BE ABLE FULLY TO MEET ALL REQUIREMENTS. AND THERE ARE DOUBTS THAT THE REGULATORS WILL HAVE SUFFICIENT STAFF OR RESOURCES TO ENSURE COMPLIANCE.
- THE APPLICANT'S PRIMARY OBJECTIVE UNDER THE EXPLORATORY PHASE WILL BE TO IDENTIFY THE OPTIMUM DEPTHS (AND LIKELY YIELD) FOR SUBSEQUENT FRACKING OPERATIONS. IF THEREFORE, A CONCLUSIVE CASE CAN BE MADE AGAINST SHALE GAS EXTRACTION. NO PURPOSE WOULD BE SERVED BY AUTHORISING ANY EXPLORATORY DRILLING, WITH ALL SOCIAL AND ENVIRONMENTAL DISRUPTION (AND PUBLIC COSTS) THAT THIS WOULD ENTAIL.
- I WOULD SUGGEST THAT WE ALREADY HAVE THE BASIS FOR A CONCLUSIVE CASE AGAINST FRACKING AS A SIGNIFICANT THREAT TO THE INTEGRITY OF THIS UNIQUE AND INCREASINGLY VULNERABLE RESOURCE.

THANK YOU.
GDW. 3/11/2013.