What went wrong?

An Investigative Report into the Extended Well Test Undertaken by:

Rathlin Energy (UK) Limited
at
West Newton A Wellsite
Fosham Road
Marton
HU11 5DA

Final Report
October 2015

TABLE OF CONTENTS

LIST OF FIGURES

FOREWORD

On-shore drilling for conventional and unconventional natural gas has been described as a revolution heralding cheap, and plentiful energy that will bring gas independence for the United Kingdom. New technologies being applied in the extraction process and the impact of these processes are contentious with debates that will continue to rage for many years to come. However, this report was not written to prove, or disprove, the many arguments, studies and reports already available. It is a factual report, written by residents living locally to the West Newton A well site, with findings based on the very real experiences and observations of Residents and Activists living in the small, rural communities of Holderness that surround the first well to be drilled in the area around Fosham.

David Cameron has acknowledged that "*people have 'uncertainties and worries and concerns about hydraulic fracturing' – known as Fracking – which involves using high pressure jets of water to release gas*". But he insisted they would be addressed once people could see functioning shale gas wells in the UK" (*The Guardian, 2014).*

Operating under Petroleum and Exploration Development Licence 183 and purportedly working to a gold standard of UK industry regulation Rathlin Energy (UK) Limited (Rathlin Energy) drilled the first of a series of exploratory wells at the site known as West Newton A. Two stages of drilling operations have been completed; site construction and an initial core drill completed in the second quarter of 2013 and a second stage Extended Well Test undertaken in 2014.

Rathlin Energy reported initial findings from the core drill were '*very exciting'. (Burton, 2014)*

This investigative report examines the way in which Rathlin Energy managed, and operated, West Newton A and brings together information obtained from a variety of sources. Environmental Activists who monitored all work undertaken at West Newton A and provided the documentary, video and photographic evidence, Residents of the surrounding villages who supported the Activists and gave testimony to the negative impact of drilling on their communities, Residents of Holderness who worked tirelessly exposing the dangers of on-shore drilling, Broken Earth Productions, No Drill No Spill, Drill or Drop, Frack Free East Yorkshire, HEY Frack Off, D and J for endless patience in proof reading the report, Freedom of Information requests and desk based research.

The report relates directly to the 2014 Planning Application agreed by East Riding of Yorkshire Council.

RATHLIN ENERGY (UK) LIMITED

Rathlin Energy (UK) Limited are an exploratory drilling company and at the time of this report are being held in negative equity. Incorporated on 21 January 2008 Rathlin Energy (UK) Limited, 8 Wimpole Street, London, W1G 9SP, is a wholly owned subsidiary company of Connaught Oil and Gas Ltd, Suite 1300, 530 – 8th Avenue SW, Calgary, Alberta, T2P 3S8 Canada. Held via Sunderland Holdings Limited, La Motte Chambers, St Helier, Jersey, JE1 1PB *(Sunderland Holdings, 2015),* Connaught Oil and Gas Limited are, to all intents and purposes, insulated from any financial or environmental issues that may beset Rathlin Energy whilst at the same time able to take over Petroleum Exploration and Development Licence (PEDL) 183 should they choose to liquidate Rathlin Energy.

The following statement by Rathlin Energy can be found on their website under '*What We Do*':

"The principal business of Rathlin Energy is in the exploration for, and development of, oil and gas reserves in Great Britain and Northern Ireland. Our extensive knowledge, combined with the technical support from Connaught, allows for us to explore for hydrocarbons in a safe and an efficient manner with as little impact to the local people and environment as possible."

Our primary objective is to explore and develop hydrocarbons, similar to those developed for decades onshore and offshore UK. Our licenses in the East Riding of Yorkshire and Northern Ireland were acquired by Rathlin Energy because it is believed that the past successes and the geology under these licenses are encouraging and justify further exploration activity. (Rathlin Energy, 2015)

Management Board

David Montagu-Smith - Chairman of the Board of Directors Director, Rathlin Energy Limited & Rathlin Energy (UK) Limited
John Hodgins - CEO Connaught Oil & Gas Ltd, Director, Rathlin Energy Limited & Rathlin Energy (UK) Limited
Dermot Nesbit - Director, Director, Rathlin Energy Limited

Rathlin Management

John Hodgins - CEO Connaught Oil & Gas Ltd, Director, Rathlin Energy Limited & Rathlin Energy (UK) Limited
Thomas Ruissen - President & Chief Operating Officer, Connaught Oil & Gas Ltd
Thomas Selkirk - Manager, Rathlin Energy Limited & Rathlin Energy (UK) Ltd
Brett Statham - Senior Vice President & Chief Financial Officer, Connaught Oil & Gas Ltd
Marlon Wall - Vice President, Engineering, Connaught Oil & Gas Ltd

CHRONOLOGY OF EVENTS

2008
17 January: Rathlin Energy (UK) Limited is incorporated.
25 January: Sunderland Holdings Limited is incorporated.
01 July: Department of Energy and Climate Change (DECC) award Rathlin Energy a Petroleum Exploration and Development Licence (PEDL) 183. Covering 241,000 acres from north of the Humber, west of Beverley, to the North Sea in the east; Rathlin Energy hold a 100% working interest in the licence.

2012
September: Rathlin Energy apply to East Riding of Yorkshire Council for Planning Permission to drill an exploratory well at Pipers Lane, High Fosham, Holderness, HU11 5DA.

2013
January: Planning Permission granted.
March – May: Site construction completed.
May: Environmental Permit BB3001FT issued.
May: 2.75 metre deep drilling cellar constructed using precast concrete rings.
June – September: Large oilfield drilling rig mobilised to drill remaining sections of the borehole, threaded steel casing installed, cemented into position and pressure tested to confirm pressure integrity.

Following maintenance repairs to remediate pressure in the annulus *(Appendix 1)* of the well, all work was suspended pending a next stage Planning Application for a programme of well testing. *(Foster, Jonathan, 2012a)*

2014
February: Planning permission granted by East Riding of Yorkshire Council, planning notice decision DC/12/04193/STPLF/STRAT.
March: Public consultation.
May – November: Work is undertaken that specifically involves the perforation of the existing well-casing to perform tests within the Bowland Shale, Namurian Sandstone and Kirkham Abbey formations. Described as requiring mechanical intervention to enhance its permeability the Upper Visean/Lower Namurian formations have extremely low permeability. Exploratory operations include a Mini Fall-Off Test within the Upper Visean/Lower Namurian interval and an acid wash and acid squeeze within the Permian interval. *(Foster, Jonathan, 2012a)*
November: Well head is capped off and the site 'abandoned'; all equipment, with the exception of one on-site security porta cabin and a tanker, is removed from the site.

SITE DESCRIPTION

Holderness is situated on the east coast of England in an area of the East Riding of Yorkshire. Rich in agricultural and farming traditions the relatively flat, low-lying Holderness Plain is bounded by the Wolds of Yorkshire to the north and west, the Humber Estuary to the south and the North Sea to the east. In spite of recent population increases over half of Holderness inhabitants continue to live in communities classed as rural.

Marshland until the Middle Ages, Holderness was drained to reveal a Devensian glacial rich and fertile soil that continues to support intensive arable cultivation to the present day.

The site known as West Newton A (West Newton Well Site, Rathlin Energy (UK) Limited, Fosham Road, Marton, Hull, HU11 5DA, National Grid Ref: TA 19268 39131), covers an area of 0.975 hectares and is located in the civil parish of Aldbrough 1.5km north of West Newton in an area of low lying land with an elevation of between 10 and 20m Above Ordnance Datum. Bounded 400m to the west by a small stream which flows northwards into the Lambwath Stream the Site of Special Scientific Interest, Lambwath Meadows, is situated 1000m to the north east of the site. Surrounded by arable land with vegetated hedgerows and an abundance of diverse wildlife in the area, prior to the well being drilled, suffered from very low noise levels and no light pollution.

The small hamlet of Marton is the closest community to the well site with its Grade II listed Roman Catholic Church of the Holy Sacrament situated approximately 600m south-west of the well.

Initial construction of the well site took place in 2nd quarter 2013. Topsoil was removed and the compound levelled with the excess soil stored in the form of a bank on the eastern and southern boundaries of the compound. The perimeter ditch was excavated and a 2.75m drilling cellar using precast concrete rings was constructed; a 1mm HDPE membrane was then laid across the site. The HDPE membrane is protected above and below by a layer of non-needle punch geotextile which was then overlaid with a 300mm layer of MOT Type 1 stone.

Following construction of the compound a water well drilling rig drilled a 36” hole into the top section of the Rowe Chalk layer to a depth of 70m. 26” welded casing was run into the borehole and then cemented back to the surface.

An oilfield drilling rig drilled the remaining sections of the well into, and beyond, the Bowland Shale. Following the drilling of each well section threaded steel casing was installed, cemented and the pressure tested to confirm pressure integrity.

Work was undertaken in the annulus of the well *(Appendix 1)* to remediate pressure issues prior to, in 3rd quarter 2013, the well being suspended.

'WE ARE NOT FRACKING'

4.1.1 Hydraulic Fracturing

Fracking or hydraulic fracturing is a process in which chemicals, sand and vast amounts of water are blasted into subterranean rocks at high pressure to force open fissures from which oil and gas can then be extracted. However, terminology used in the gas and oil industry can be complicated with a multiple of different titles covering the same process.

In completing form EPB, Application for an Environmental Permit – Part B9 permit for onshore oil and gas exploratory work, Rathlin Energy confirmed they would be injecting "*aqueous liquids*" into the well for "*well stimulation or hydraulic fracturing"* and that as a result of this activity they had made arrangements for the disposal of Naturally Occurring Radioactive Materials (NORMs) in both aqueous and solid waste. (*Foster, 2012b, p.10)*

This was reconfirmed in "*Point 3.2.1, A Ground Water Activity* " *(Foster, 2012c, p.7)* when the following statement was included "*The West Newton exploratory operations include a Mini Fall-Off Test within the Upper Visean/Lower Namurian interval and an acid wash and acid squeeze within the Permian interval. The Upper Visean/Lower Namurian formation has extremely low permeability and requires mechanical intervention to enhance its permeability*."

On 12 June 2014 the Hull Daily Mail published a statement from David Montagu-Smith, Chief Executive Officer of Rathlin Energy, in which he specified *"As part of our drilling programme we did reach down to, and below, the level of the "Bowland" shale (as we were permitted do).*

The Bowland shale is an important source rock for the conventional hydrocarbons in East Yorkshire, and we need to know as much as we can about their characteristics.

But we were never going to attempt to "frack" the shale." (Montagu-Smith, 2014a)

In February 2014 the Department of Energy and Climate Change published *"Fracking UK Shale: planning permission and communities"* in which it states *"in its Community engagement Charter, the UKOOG committed to a community benefits package. The operator will:*

- *at exploration/testing stage, provide £100,000 in community benefits per well site where fracturing takes place" (2014, p.5)*

UKOOG is a UK representative body of the oil and gas industry and covers both the exploration and production stages. It reports to being committed to being *"the best possible neighbour it can be in the communities where it's members operate". (2013a)*

UKOOG's objectives are to:

- *enhance the profile of the whole onshore industry (both conventional and unconventional;*
- *promote better and more open dialogue with key stakeholders;*
- *deliver industry wide programmes; and*
- *ensure the highest possible standards in safety, environment management and operations.*

(2013b)

In 2012 UKOOG announced oil and gas industry led benefits for the communities in which its members were operating. The key elements it's members had signed up to include:

- *"UKOOG has published a Community Engagement Charter, which sets out the industry's commitment to consult openly and honestly with local communities at all stages, including in advance of planning permission applications;*

- *£100,000 per site will be paid to the local community situated near to each exploratory (hydraulically fractured) well site. This will be paid by the operator, regardless of whether or not recoverable deposits are found;*

- *1% of production revenues will be paid to communities during the production stage, before the operator has accounted for their costs;*

- *Each year, operators will publish evidence detailing how the commitments within the community benefits package are being met;*

- *Our members have committed to reviewing the community benefits agreement as the industry develops in the coming years and pledged to consult further with local communities on an ongoing basis."*

(2013a)

In 2013 UKOOG changed it's structure and became a "*formal organisation*". Rathlin Energy have been involved in UKOOG since January 2013 *(Appendix 2)* and have a link to UKOOG on their website under *"Industry"* . *(Appendix 3)*

4.1.2 **Mini Fall-Off Test**

"For clarity, the intention of the mini fall-off test is not to fracture the formation but to establish if and at what pressure the formation becomes permeable. The information gathered during the mini fall-off test will help determine whether the formation is capable of being hydraulically fractured. Hydraulic fracturing is not being considered as part of the application which this plan supports." (Foster, Jonathan et al, 2012, p.11)

Halliburton, "*one of the world's largest oil field services companies"*, have written, "*With the shift towards unconventional, ultra-low permeability reservoirs, the only type of test that is economically practical for operators to determine reservoir and frac properties is the Diagnostic Fracture Injection Test (DFIT).*

The DFIT is also known as a FET (Fluid Efficiency Test), MFO (Mini Fall-off) or Minifrac test." (*Costello, Christina, 20 February 2012*)

The DFIT™ (Trade Mark of Halliburton), has become the leading pressure test for Halliburton. Schlumberger, "*the world's leading supplier of technology and project management to the oil and gas industry*", "*call their equivalent test a Mini Fall-off test with other industry operators and service companies calling their comparable test a Pre-Frac, Injection Fall-off, Data Frac or Mini Frac.* It has been defined as *"a short duration, small volume fracturing operation where a small amount (<100 BBLS) of KCL water is pumped until fracture initiation. At that point the wing or frac valve is closed allowing the well's pressure to fall-off naturally over the course of 24 to 48 hrs (or longer)." (Halliburton, 2015)*

Rathlin Energy proposed the following tests at West Newton A:

- *"A Namurian formation flow test:*
  - to establish whether gas is present in the reservoir
  - to establish whether there is a commercially significant rate and volume of gas present

- *A Bowland Shale formation mini fall-off test:*
  - to collect reservoir engineering data
  - to help estimate the hydrocarbon reserve potential in the basin

- *A Kirkham Abbey formation flow test:*
  - to establish whether gas is present in the reservoir
  - to establish whether there is a commercially significant rate and volume of gas present

TS (Tom Selkirk) *said that a decision had been taken NOT to exercise the company's right to carry out the first two tests at West Newton." (Rathlin Energy (UK) Limited, 2014a)*

A report from the Community Liaison Meeting Rathlin Energy *(2015)* cited in Hayhurst *(2015)* included the statement *"We did not exercise our permitted option to undertake a mini fall-off test at West Newton A and we have no intention to. We may revisit the site where we still have permission to drill and test a second well"* However, during a discussion witnessed by several Activists and Local Residents it was confirmed by Caroline Foster, Field Manager, Rathlin Energy, that a mini-fall off test had taken place in the Bowland Shale at the well site known as West Newton A. *(No Drill No Spill, 2015)*

4.1.3 **Acid Wash / Acid Squeeze**

Drilling fluid, cementing and completion operations often restrict the flow of petroleum within a carbonate formation. This impairing of flow through the size reduction or blockage of natural fissures is called formation damage. In order to clean out the fissures a mixture of acid, usually hydrochloric acid, and water is applied at low pressure to the formation; this is generally called an acid wash. *(Poyyara, Patnana & Alam, 2014)*

Rathlin energy indicated that the concentration of hydrochloric acid to be used during the acid wash undertaken at West Newton A would be 15%. *"Carbonate formations are heterogeneous with significant variations in porosity and permeability. To improve the flow of petroleum within a carbonate formation, an acid, most commonly hydrochloric acid (HCI) at 15% concentration with water (i.e. 150L of HCI with 850L of water), is applied to the formation through the wellbore." (Foster, 2012c, p.13)*

Following the acid wash an acid squeeze was scheduled to be undertaken. A solution of hydrochloric acid of *"between 6m3 to 11m3is*" was to be applied to the formation "*at a pressure not exceeding the fracture pressure*". During the process the acid is "*squeezed*" into the naturally occurring fissures and pores within the strata formation; this increases the permeability in the near hole. The acid wash and squeeze was stated to being undertaken in the "*Permian interval at a depth of 1,850m"* with the added qualifier "*If more than one interval within the Permian interval is to be tested, the operation will be repeated*". *(Foster, 2012c, p.13)*

4.1.4 **Summary**

What is known, whether drilling conventionally, or unconventionally, Rathlin Energy did drill into the Bowland Shale, it was confirmed they were undertaking a mini fall-off test in the Bowland Shale, they did have chemicals on site and they were expecting Naturally Occurring Radioactive Minerals to be released from well tests.

ATMOSPHERIC POLLUTION

5.1.1 **Flaring**

Flaring, or the burning of natural gas, is either discouraged or against the law in most areas of the world. However, flaring can be permitted during drilling or well testing, when there is no market for the gas or before a transport line is installed. (*Hyne, 2013)*

Rathlin Energy, after considering alternative methods of flaring, undertook to use a single tip shrouded flare through which to vent waste gas collected as a by-product of testing at West Newton A well site. An assessment to determine the *"likely impact of flaring operations on local air quality, in particular sensitive areas of habitation, and attainment of applicable air quality standards"* (*Environmental Scientifics Group Limited, 2013, p.3*) was produced.

Enclosed Single Flare – West Newton A

The *Air Dispersion and Modelling Report (2013)* includes historical background checks of concentrations of Nitrogen Dioxide and Carbon Monoxide supplied by DEFRA, an estimate provided by Rathlin Energy of the volume of waste to be flared and an air quality management proposal. The report concludes, *"The modelling assessment methodology and necessary assumptions provide a conservative assessment of impact on air quality. The overall results and conclusions reached therefore incorporate a reasonable margin of comfort in spite of the inevitable uncertainty of such modelling studies."*

It is concluded that the flaring operations proposed during well exploration will not affect the attainment of air quality standards within the local area. For the nearest locations of human habitation and statutory designed sites, the impact of flaring on air quality is around or below the level at which it would be considered significant." (*Environmental Scientifics Group Limited, 2013, p.17*)

During a Community Liaison Meeting Philip Silk, Planning Manager, Moorhouse Drilling and Completions, reiterated that flaring would not adversely affect air quality with, an almost dismissive disregard, for residents living close to the well site. "*He said that following a full impact assessment, an independent report had been produced by ESG and submitted as part of the EA process. He said that the conclusion reached was that the flaring will not affect the attainment of air quality standards and the impacts to the nearest receptors are considered insignificant." (Rathlin Energy (UK) Limited, 2014b)*

5.1.2 **Emissions Management**

On 10 September 2014 a complaint was made to the Environment Agency, National Incident Recording System (NIRS) number 01275977, of noxious odours emanating from West Newton A well site on 09 September 2014 at 20:05 and 10 September 2014 at 11:25. (*Environment Agency, 2014a)*

Following the complaint, an investigative visit by Environment Agency Officers was carried out. As a result of the visit Compliance Assessment Report (CAR), ID 400996/0219962 was issued which concluded "*varying strengths of odour were detected, dependent upon their location, emanating from the site; the most probable influential factor was cited as being wind direction"*. (*Environment Agency, 2014a)*

During the inspection it was noted by the Environment Agency the flare was acting as a cold vent with odour detected off site being also present on site. The Environment Agency concluded activities on site were giving rise to atmospheric pollution externally of the site boundaries with possible sources of odour being:

- "*Green brine storage tanks 1-5 with vents to the atmosphere;*
- *The wire line running to the well;*
- *Cold venting via the flare stack;*
- *Blue coloured open brine storage tanks, though these were not in use at the time;*
- *Oil / condensate tank venting to the atmosphere;*
- *Expro water tank venting to the atmosphere." (Environment Agency, 2014a)*

With a variety of possible reasons for the odour Rathlin Energy were instructed to undertake tests to determine causation and to produce, and implement, an Odour Management Plan, as permitted under Condition 3.2 of the permit, by 19 September 2014.

- Action 1*:*
  "Carry out sampling and analysis of the release from the atmospheric vent of a brine tank whilst it is being filled with brine recently brought to the surface from the well. The purpose of the analysis is to identify the substances being released to atmosphere. The analysis must include as minimum benzene, toluene, xylene, mercaptans, and organo sulphurous compounds. Data to enable the calculation of a release rate from the tank must also be recorded e.g. Tank fill rate during sampling period. Details of the proposed monitoring should be submitted to the Environment Agency prior to the monitoring being carried out. Timescale for monitoring to be carried out and results submitted to Environment Agency: 19 September 2014." (Environment Agency, 2014a, p.2)

- Action 2*:*
  "Carry out sampling and analysis of the release from the flare stack whilst it is being used as a cold vent. The analysis must include as a minimum benzene, toluene, xylene, mercaptans, and organo sulphurous compounds. Data to enable calculation of a release rate from the vent must also be recorded. Details of the proposed monitoring should be submitted to the Environment Agency prior to the monitoring being carried out. Timescale for monitoring to be carried out and results submitted to Environment Agency: 19 September 2014." (Environment Agency, 2014a, p.3)

- Action 3*:*
  "Submit an odour management plan which identifies sources of odour and measures that will be taken to manage and minimise the risk of pollution from odour. Timescale: 19 September 2014" (Environment Agency, 2014a, p.3)

The Enforcement Response contained a warning to Rathlin Energy regarding the breaches to permit and non-compliance stating "*The activities are giving rise to pollution outside the site due to odour (permit condition 3.3.1 and 3.3.2)". (Environment Agency, 2014a)*

Despite Rathlin Energy admitting to venting *"Small quantities of gas" (Appendix 4)* they suggested the affects to health experienced by residents and visitors*,* which resulted in complaints to the Environment Agency*, "may not be a consequence of the odour coming from the site" (Appendix 4)*. Attempts by Rathlin Energy to place the responsibility to investigate the noxious odours with the Environment Agency were made with the request that all claims be substantiated and other potential sources be investigated. This, despite the Environment Agency having already clearly identified the probable sources of the odour and Rathlin Energy agreeing to put an odour management plan in place. *(Appendix 4)*.

In response to Rathlin Energy's e-mail *(Appendix 4)* the Environment Agency confirmed that representatives from the Agency had, on two separate occasions, identified the source of the odour as emanating from West Newton Well Site A. *(Appendix 5)*.

On 16 September 2014 Rathlin Energy again further disputed the findings of the Environment Agency by questioning the honesty of residents initiating the complaints. It implied the odours affecting residents' health may be due to factors other than issues at West Newton Well Site A whilst adding "*I am also pleased to note that the EA Officers did not experience any symptoms described in the complaints, nor, as mentioned have any of our well site crews (day and night shift), security officers or the police who attended site daily" (Appendix 6).* However, on 05 March 2015 a message was received by an Activist from an ex member of Beacon Security confirming what staff had been quietly reporting to Activists at the time; "*the smells wer getting reported by bacon staff and they was told not to report it so ea wouldn't come to check it*" [sic] *(Appendix 7)*

The contradictory format of the e-mail may be noted in paragraph two; *"Rathlin Energy is conscious that an assumption that the health effects are a result of the unburnt gas from the West Newton Well Site could in fact mask a more serious and more local environmental or health and safety issue that is not related to our operations".* With a further question to the Environment Agency by Rathlin Energy that attempted to cast doubt on the honesty of the complainants "*whether anything has been done by the EA or any other agency to determine whether these symptoms are real*" *(Appendix 6)*

In response to Rathlin Energy's e-mail *(Appendix 6)* the Environment Agency reaffirm their request to Rathlin to implement tests and an agreed odour management plan; this request stemmed from the findings of the representative officers conducting the site visit on 10 September 2014. *(Appendix 8)*

Correspondence between Rathlin Energy and the Environment Agency contain discussions on the acquisition of samples of gas from the brine tanks and flare stack, the means by which samples will be captured, the company that will carry out the analysis of the samples and the chemicals that will be tested for; Benzene, Toluene, Xylene, Mercaptans and Organo Sulphurous Compounds. The drafting of an Odour Management Plan is discussed with a written request to the Environment Agency requesting approval of the methods set out by Rathlin Energy for the sampling and the testing of the sample. (*Appendix 8)*

It can be deduced from the correspondence between Rathlin Energy and the Environment Agency that Rathlin Energy's parent company Connaught Oil and Gas were "*being fully informed of the situation as it unfolds"*. *(Appendix 4)*

In response to Rathlin Energy's sampling and testing proposal the Environment Agency point out "*no standard is in place for the method of sample collection proposed"* with the recommendation "*as an alternative absorption tubes be used"*. Questions regarding the transportation methods of the sample, the time between the acquisition of the samples and the performance of laboratory analysis were also raised.

Further reference was made with regard to flow rate measurement and gas under pressure in liquids.

The Environment Agency also suggest a sweep for additional Volatile Organic Compounds that may be present and which would not be covered by the specified tests.

On 16 September 2014 at 15:40 the Environment Agency once more responded to Rathlin Energy stating: *"I suspect that Tedlar bag sampling and GCMS analysis would be acceptable for this week and give an insight into what is being emitted, but future monitoring, especially of a more quantitative nature would need to be covered by MCERTS and need to be justified with more detail."*

It can be ascertained from the correspondence that in spite of the Environment Agency specifying alternative, acceptable test methods of sampling, transportation and testing Rathlin Energy's initial proposals, originally rejected by the Environment Agency as not being an acceptable method of collecting and testing, were accepted as a temporary measure.

E-mail correspondence between Rathlin Energy and the Environment Agency confirms samples were taken and sent for analysis. It is also clear Rathlin Energy receive advanced information of Environment Agency Officers' compliance visits *(Appendix 8).*

On 19 September 2014 the Environment Agency carried out a visit to West Newton A to inspect Waste Operations *(Environment Agency, 2014b)* and Installations (*Environment Agency, 2014c).* Neither report contains information of the results of specific testing requested by the Environment Agency *(Environment Agency, 2014a).* At the time of the inspection no well testing activities were taking place on site with the well reported to be *"shut in"* and the "*enclosed flare not operating*". However, proposed changes to well testing to prevent cold venting at pressures below 2 bar were discussed *(Environment Agency, 2014b).*

Four reported incidents of off-site odour officially logged by the Environment Agency between the visits of 10 September 2014 and 19 September 2014 *(Appendix 26)* were not addressed in the reports.

On 19 September 2014 the Odour Management Plan and Analysis of Emissions and requirements to be met before re-commencement of operations at West Newton Well Site A were discussed, these included the submission of an Odour Management Plan and emission monitoring assessment and results. Documented dialogue stated "f*ollowing discussions on site today it appears that the emissions monitoring arranged was more appropriate for ambient air monitoring rather than the stationary source monitoring requested*." Although no official report of the on-site discussion regarding the suitability of air quality monitoring arrangements can be found it may be deduced that the existing arrangements in place were unsuitable. The return correspondence from Rathlin Energy at 17:46 assures the Environment Agency that they understand compliance requirements and that an odour management plan is almost complete. Steps to be taken to ensure that no further odour emissions occur; "*As per discussions on site, Rathlin Energy has identified the VOC's are being released to atmosphere (cold vented) when pressure of the gas flow at the flare drops below 1.2 at and results in insufficient operating pressure at the flare unit. The flare unit requires a minimum operating pressure of 1.2 bar(g) to initiate gas flare. Below 1.2 bar(g) the flare will not ignite.*

The forward plan is not to cold vent. This will be achieved by ensuring that no gas is flowed to the flare unit below 2 bar(g) pressure. At the point at which gas flow from the well drops to 2 bar(g) the well will be shut in. This will provide a safe operating margin."

The e-mail also states that the odour management plan will be completed within 2 days.

It can be seen from the Email correspondence between the Environment Agency and Rathlin Energy detailed requirements had been specified, including a request the Odour Management Plan had to be submitted by 19th September 2014. Neither of the Odour Management Plans submitted on 22nd September 2014 (*Appendix 9)* met these requirements. On 22nd September 2014 the Environment Agency informed Rathlin Energy of additional actions to be undertaken if the Odour Management plan was to be acceptable. "*Other sections of the plan are not approved and need to be amended to set out the additional appropriate measures you will take. The plan is deficient in the areas set out in the attached document*." The Environment Agency also clearly state "*We approve*

section 10.1.4 of the odour management plan which details measures for the incineration of natural gas. No cold venting of any gas must take place. This includes gas with a high proportion of nitrogen". *(Appendix 12)*

On 24 September 2014 (*Appendix 15)* the Environment Agency, on assurances from Rathlin Energy, gave permission for Rathlin Energy to re-commence operations. However, no evidence can be found to substantiate Rathlin Energy had provided the Environment Agency with a working Odour Management Plan.

On 24 September 2014, as previously confirmed to Rathlin Energy, the Environment Agency carried out an inspection of Waste Operations and Installations at West Newton A . Both the Waste Operation Inspection, *(Environment Agency, 2014d)* and the Installation Inspection *(Environment Agency, 2014e)*, were undertaken at the same time.

Both reports detail non-compliances in the management of the site. CAR 400996/0220751 highlighted operating procedures for some of the equipment on site was not adequate to prevent odour emissions from the equipment whilst in use. It included the following observations. "*Methods for flow monitoring and sampling of tank breathers were discussed. The pressurised dual compartment oil/water tank, and atmospheric oil and water tanks share a common vent line which vents via tank of fluid (referred to on site as a scrubber) which is intended to remove/reduce odorous emissions. At the time of audit no one present was aware what fluid was in the tank or if any ongoing monitoring of it was carried out to determine if it was effective or fully reacted and requiring replacement. A hydrocarbon type odour was present on site near to the tank. One green cylindrical horizontal brine tank is currently in use and the tank breather was routed to atmosphere via an IBC of potassium permanganate. Abatement will be required for each of the brine tanks*". *(Environment Agency, 2014d)*

The Environment Agency, once again, put in a series of actions, with time scales, that Rathlin Energy should have undertaken in order to comply with their Environmental Permits. "*Put an EMS procedure in place which identifies the abatement required on each tank breather, what the reactant for each breather is, who is responsible for testing and maintenance of the reactant, how the reactant will be tested and monitored to ensure it is replaced before it becomes ineffective, and how records of testing and replacement will be kept. Train out the procedure to those with responsibility for testing and maintenance, and get them to sign the training record. Timescale: 3 October 2014*". *(Environment Agency, 2014d)*

The CEB4500 enclosed flare was being operated by third party contractors who provided two dedicated operators working on a rotational 12 hour shift system. Three thermocouples continuously monitor the temperature of both pilot lights and the burner box with the readout display at the side of the flare. A log sheet for half hourly flare temperature recording was in situ however, the log sheet did not form part of Rathlin Energy's EMS. The Environment Agency advised "*Put an EMS procedure in place to require half hourly logging of flare parameters by the flare operators. Train out the procedure to both flare operators to ensure half hourly logging is carried out on both shifts. Get both flare operators to sign the training record. Timescale: 27 September 2014*." *(Environment Agency, 2014e)*

It may be ascertained from the above Compliance Assessment Reports that Rathlin Energy's management were once again deficient in their duty to ensure robust procedures and processes were in place with breaches to permit BB3001FT.

On 24 September 2014, with a 5 day extension to site specific protocol, permission to resume flaring, was granted by the Environment Agency to Rathlin Energy *(Appendix 13)* However, a series of Email correspondence between the Environment Agency and Rathlin Energy shows that, on the resumption of work, odour emissions quickly became an issue *(Appendices 14, 15, 16, 17, 18, 20, 21, 22 & 23)* with off-site reports on 25, 26, 29 and 30 September 2014 *(Appendix 26).*

Despite this Rathlin Energy continued to have issues with flaring, the denial and defence of which led to conflicting statements. "*There was at no time any reoccurrence of the odour emitted last week*" and "*The odour from incineration was less noticeable*." *(Appendix 20)*

NIRS report 1281178 details another complaint regarding the noxious odours, "*The caller rang with regard to the odour from the above company. They are based on the site and the odour last week was horrendous". (Appendix 16)* However, later correspondence between the Environment Agency and Rathlin Energy corrects this error to an off-site complaint. *(Appendix, 18)*

On 26 September 2014 Rathlin Energy submitted a revised Odour Management Plan to the Environment Agency *(Appendix 26).*

On 30 September 2014 the Environment Agency recorded gas had been sent to the flare for 10 minutes on 29 September 2014 however, "*no record of temperature was available" (2014l).*

"Monitoring of gas flare data is a requirement of permit condition 3.5.1". (Environment Agency 2014l). Permit condition 3.5.1 requires an operator to undertake specific monitoring in the case of West Newton A the flare temperature should have been noted and recorded. Despite being advised on 24 September 2014 *(Environment Agency 2014e)*to include flare temperature as part of their Environmental Management System it was recorded that this procedure had still not been implemented *(Environment Agency 2014l)* breaching condition 1.1.1, category level C4, Management Systems, and condition 3.5.1, category level C3, records of activity.

Breaches to permits are categorised between C1 – C4, where C1 is the most serious and C4 the least serious. Continued non-compliances can lead to an escalation of enforcement, formal cautions or prosecutions.

On 01 October 2014 the Environment Agency, following further off-site complaints *(Appendix 26)*, again contacted Rathlin Energy to advise that CAR *400996/0219063* issued on 28 August 2014 *(Environment Agency, 2014f)* had not been actioned despite the deadline of 08 September 2014 having long past. Rathlin Energy were given a further 10 days to comply, including a reminder to submit the '*air dispersion modelling of the impact of gas venting releases"*.

On 17 October 2014 Rathlin Energy submitted a further revised Odour Management Plan *(Appendix 27)* confirming they had implemented the simplified odour recording system recommended by the Environment Agency. However, despite the new systems implementation further complaints of noxious odours emanating from the site were recorded on 05, 15, 16, 17, 20, 24 and 29 October 2014 *(Appendix 26).* During this time Rathlin Energy continued to work on the provision of an emissions Site Specific Protocol for its breather tanks *(Appendix 26).*

Night Time Flaring – West Newton A

Following the inspection carried out on 22 October 2014 by the Environment Agency three breaches to permit condition 3.3.1 were noted with cold venting having taken place on 05, 15 and 17 October 2014. A further comment was added, "*multiple failures of permit conditions cannot be adequately reported within a single CAR form". (Environment Agency, 2012g)*

On 19 September 2014 The Guardian published an article on the noxious odours emanating from West Newton A which included interviews with two residents, both living locally to the site. One stated "*the smell is hideous, very distinctive, pungent and nauseous. It comes in waves. It started last week and has continued since."* With the second complainant, living closest to the site, reporting "*I could not go outside on Friday I had to ring Environmental Health, my eyes were watering, my throat was stinging and feeling weird and I could not stop coughing*." Despite the Guardian article being published on 19 September 2014 Rathlin Energy responding to residents' allegations with *"The odour is not hazardous to health".* (*Vidal, John, 2014)*

However, as the Environment Agency had only requested Rathlin Energy carry out specific emissions tests on 10th September 2014 with no reported results it is unclear how Rathlin Energy could possibly have known what chemicals, or compounds of chemicals, were causing the odour and if they could have been damaging to health.

On 16 September 2014 at a Community Liaison Meeting Jonathan Foster *"said that the odour management plan had helped to mitigate the problem which, as was generally acknowledged, was intermittent and largely localised. He said that the approved flare stack did not contemplate this kind of operating condition and that too had contributed to the issue. He confirmed that Rathlin would be seeking an alternative flaring solution going forward". (Rathlin Energy (UK) Limited, 2014a)*

5.1.3 **Summary**

It is clear from the above Rathlin Energy seriously failed in their duty to protect residents and wildlife from the adverse impact of waste gas disposal by cold venting. Despite multiple breaches to Environmental Permits through poor management and a lack of due care and attention to required procedures and processes the Environment Agency appear to have been extremely lenient in their dealings with Rathlin Energy.

Regardless of the fact that on 10 September 2014 the Environment Agency clearly stated the source of the odours as originating from West Newton A Rathlin Energy continually attempted to circumnavigate the issue by placing responsibility on the Environment Agency to determine the source and effect or, irresponsibly, casting doubt on those reporting the odours.

Given the pains the Environment Agency made to respond to complaints with multiple visits to West Newton A and the efforts to support Rathlin Energy to implement a robust sampling, transportation and testing system to ensure all required permit standards would be met the Environment Agency did not ensure its recommendations were fully executed.

In pre-warning Rathlin Energy of dates and times of visits the Environment Agency enabled Rathlin Energy to ensure the well was '*shut in'* during their visits. Whilst it cannot be categorically stated this was done with intent by Rathlin Energy it does not inspire local communities affected by the noxious odours with confidence in the Environment Agency to fully support residents with their concerns.

The Environment Agency, it could be alleged, once more appear to be complicit with Rathlin Energy in permitting them to continue with full operations whilst offensive and noxious odours were still emanating from the site.

Poor management and record keeping is an apparent reoccurring theme running throughout the duration of Rathlin Energy's Extended Well Test. No records were made of odour management for emissions from either the brine tanks or the atmospheric oil and water tanks. No records were available at the time of inspection by the Environment Agency as to what liquids were present in the tanks at the time of inspection, who was responsible for managing the reactants responsible for removing odour emanating from the brine tanks or of the frequency with which they were changed. Significantly no procedures were in place, or written records kept, of the flare parameters during times of operation; again this reflects an apparent lackadaisical attitude and culture, originating from management and seemingly running endemically throughout the whole company and the sub-contractors Rathlin Energy employed.

Noxious Odours continued to be an issue until Rathlin Energy suspended the well. The Environment Agency however, continued, despite Rathlin Energy not having put in place any of the actions requested of it, to permit Rathlin Energy to continue operations.

LIGHT POLLUTION

6.1.1 **Lighting Management**

The landscape surrounding West Newton A well site is agricultural and flat with no light pollution and a diverse ecosystem that reflected this.

Planning permission for the second stage Extended Well Test required the submission of a lighting plan; this was included as Appendix 9 in the Waste Management Plan. *"The lighting plan has been implemented to ensure compliance with planning permission and periodic monitoring of the lighting is undertaken to ensure light overspill is reduced to a minimum*". *(Foster, 2012c, p.28)*

In an attempt to mitigate the impact of artificial lighting on the environment the 2012 Lighting Management Plan (LMP) produced by Moorhouse on behalf of Rathlin Energy included a detailed "*Sources and Impact*" table. Page 4, point 1.3 states "*Whilst the document has tried to be as precise as possible in relation to lighting specifications, these may be subject to change, however, the management and mitigation measures discussed in this document will be applicable at all times*." *(Moorhouse, 2012a, p.5)* Specifications for a maximum of 4 x 1000W metal halide lighting towers had been proposed and it was on this basis all calculations in the LMP had been made. With mitigation in the form of screening, light baffles and careful positioning of on-site equipment to ensure a reduction in light spill and glare*. (Moorhouse, 2012a)*

On 26 February 2014 at a Community Liaison Meeting *DF (Resident) said that he would like assurances that the lighting would be controlled so that no lights from the towers would be pointing out from the site".* In responding CF (Caroline Foster, Field Manager, Rathlin Energy) "*said that all possible would be done to prevent this from happening and that it would be continually monitored. She said that anyone with any concerns should contact the helpline immediately to enable the site team to respond quickly. DF thanked CF and said that he would re-communicate that message. DF acknowledged that with the timeframe of works potentially starting in May, the days would be lighter for longer anyway and that that in itself was a mitigation measure." (Rathlin Energy (UK) Limited, 2014d)*

On 16 September 2014 *DF (Resident) raised concerns about light pollution at the site. JF* (Jonathan Foster, HSE Manager, Rathlin Energy) *said that the lights are pointing out more than they would normally be so that the site security staff can safely patrol the site. He said that additional security are on site because camping there. (Rathlin Energy (UK) Limited, 2014a)* However, during the summer there was only ever a maximum of 14 peaceful Activists camping adjacent to the well site with a more normal presence of between 3 – 5 Activists for the duration of the Extended Well Test Rathlin Energy did not need to direct lights outwards to the degree they did. Given also that the north side of the compound is surrounded by hedging and open fields to the East and West there was absolutely no need for the North facing lights that were affecting Withernwick to be positioned in the way they were; there was no way Activists, even if they had wanted to, could have vaulted over the hedge, which stands at over 9 feet in height, and jumped into the compound.

6.1.2 **Impact of Light Pollution on Communities**

"Many medical researchers consider light pollution to be the fastest growing and most pervasive forms of environmental pollution." (Chepesiuk, 2009, p.2) The problem of light pollution in rural areas has become so problematic voluntary grassroots organisations such as the Campaign to Protect Rural England have started to bring the issue to the forefront of their focus.

Throughout the duration of the Extended Well Test the badly angled floodlighting sent a glare into residents' homes that penetrated curtains and illuminated bedrooms. In 2004 published research demonstrated a link between artificial night time light causing higher rates of breast and colorectal cancers in the developed world. *(Pauley, 2004)*

Rig and tower lighting – West Newton A

Despite the LMP stipulating four lighting towers would be the maximum requirement six towers were eventually on site. The illumination from four towers adversely affected residents in Withernwick and the impact when six towers were in operation was considerably worse.

The LMP also stated "*As part of Rathlin Energy's commitment to ensuring its operations do not impact on local residents, a community contact number will be provided. This will allow local residents to contact a member of the Rathlin Energy project team 24 hours a day. Any complaints received from local residents will be investigated and dealt with promptly" (Moorhouse, 2012a, p.9).* It is understood from Residents attending Community meetings and visiting the well site that in spite of constant complaints to Rathlin Energy that light pollution emanating from the site was affecting their ability to sleep the non-conformences were not addressed with those complaining left feeling they had not been listened to. The emergency number was answered by West Newton A on-site security.

6.1.3 **Glare on Public Highway**

The *"Sources and Impacts"* table on page 5 highlights an impact in the form of glare onto the highway with point 7.1, "*Site Layout",* stating "*lights will be positioned around the perimeter of the site and raised high and face downwards to reduce overspill. No lighting will be focused directly onto the public highway". (Moorhouse, 2012a)*

Writing in Exterior Lighting as a Statutory Nuisance and quoting from the Wallingford Herald, Taylor and Hughes cited that a death took place that was documented as being "*caused at least in part by badly angled floodlighting*". *(2005, p.2)*

Despite constant complaints from Environmental Activists that beams from the towers were shining directly onto Fosham Road causing a dangerous glare for users of the highway Rathlin Energy refused to listen or take any actions to mitigate the impact. This was regularly highlighted to on-site Security, however the information was unfailingly ignored.

6.1.4 **Summary**

Light pollution affecting people's lives is covered by both the Clean Neighbourhoods and Environment Act 2005 and the Environmental Protection Act 1990. However, despite knowing this Rathlin Energy did nothing to mitigate the impact of the light pollution and the only action seemingly open to residents being that of instigating legal proceedings. This is a lengthy and expensive process which residents simply could not afford.

In spite of numerous complaints from Residents and Activists Rathlin Energy did not discuss any of the issues raised or make plans to mitigate the impact. No audits to confirm compliance with the agreed plans in the Lighting Management Plan can be found to have been undertaken despite this being specified in the Planning Application. Non-conformances were never addressed and no action was undertaken to mitigate the results of the light pollution.

The apparent lack of due thought and consideration on the part of Rathlin Energy as to the impact on the quality of life and safety of those affected by the issue of light pollution left complainants feeling they had been treated extremely dismissively.

NOISE POLLUTION

7.1.1 Noise

The Government's Department for Environment, Food & Rural Affairs states that "*noise can have an effect on human health, amenity, productivity and the natural environment" (Dickens et all, 2014, page 1)* with the World Health Organisation identifying "*environmental noise as the second largest environmental health risk in Western Europe*". *(2012)*

West Newton A well site is situated in a rural setting that is extremely quiet and flat with few natural sound barriers resulting in a tendency for anthropological noise to carry substantial distances. Low frequency sounds, such as those emitted by drilling, travel far. The topography of the land and low background noise was a major consideration when considering the impact of noise generated through drilling processes. The following statement by Spectrum Acoustic Consultants in the Noise Impact Assessment *(2012)* and included in the planning application highlights this.

"*As indicated by the results, background LA90 noise levels at the nearest community locations to this exploration well site are at a low level, with mean night time levels falling to below 30dB(A) at both locations. Daytime and evening background noise levels are also at low levels of 38dB(A) and 30dB(A) respectively. The low background noise levels are, however, consistent with the rural nature of the environment around this well site, reflecting the absence of any significant steady noise sources*". *(2012, p.6)*

7.1.2 Noise Management

Following complaints from Residents to the Environment Agency CAR 400996/0219063, was issued on 28 August 2014 *(2014f)*. The findings of the inspection revealed already high noise levels were exacerbated by the doors of the mud pump container being kept open in an attempt by on-site contractors and employees to mitigate overheating issues. Although Heras Fencing with acoustic panelling was placed around the base of the rig in an endeavour to counteract the noise it proved to be ineffective as residents in Marton, Withernwick and West Newton reported excessive noise emanating 24 hours a day from the site. At a Community Liaison Meeting RJ (Resident) "*said that there is a constant grinding noise coming from well."* Jonathan Foster "*suspected that it was the brake in the drum of the wire-line equipment and that he would look into the matter*." *(Rathlin Energy (UK) Limited, 2014a)* From Jonathan Foster response it would appear Rathlin Energy already knew about this issue but had done nothing to mitigate the problem.

7.1.3 Summary

Despite the work on the well site being classed as temporary the well site was operating 24 hours a day for at least 10 weeks. Residents complaining of the noise pollution found no course of redress and their objections appeared to be totally ignored by Rathlin Energy, who did not seem to either understand or take the matter seriously. Understandably Residents were left feeling tired and isolated and the lack of support from the Environment Agency did not inspire residents with the confidence that the Agency was operating with transparency and fairness.

HYDROLOGICAL IMPACT

8.1.1 East Yorkshire Chalk Aquifer

The Upper Cretaceous Yorkshire Chalk water system underlies an area of approximately 1800 km² and is associated with deep fissuring and exceptionally high permeability. The East Yorkshire Chalk aquifer has supplied much of the water to the City of Hull and Humberside since the end of the 19th Century. *(Elliot, et al, 2003)* A water quality impacts and palaeohydrogeology study of the chalk aquifer published in 2001 identified the regional aquifer as having a baseflow contributed to by chalk springs that are drought sensitive leading to excessive drawdowns through dry periods. *(Elliot, et al, 2001)*

Although there were more than twelve pumping wells in the Chalk aquifer in 2003 they were only extracting 7% of the total recharge the aquifer was receiving. Despite this leading to the thought the Chalk aquifer was a safe, under developed resource it was known the aquifer was "*displaying early signs of hydrological stress*", including overexploitation and the effect of droughts. An in-depth study undertaken in 2003 states "*hydrogeochemical indicators point to further effects of anthropogenic pollution impacts in the unconfined aquifer and both recent and ancient saline intrusion in its semi-confined and confined zones". (Elliot, et al, 2003)*

Water monitoring borehole in East Riding of Yorkshire
Constructed in 1971 to a depth of 121 meters
(British Geological Survey, 2015)

8.1.2 **Potential Contamination to Aquifer**

The URS Hydrogeological Risk Assessment (*2012a*) stated "*the hydraulic properties of the Chalk are predominantly controlled by the distribution and degree of fracturing and fissuring, which increase at the near surface due to weathering and groundwater table fluctuations. The predominance of such features declines with depth especially below the top 25 to 50m of the Chalk. Also, declines in the degree of fracturing can be noted in areas where the Chalk has a high Clay or Marl content. Beneath the low permeability Boulder Clay at the site, the confined Chalk aquifer is indicated as having good permeability as presented in Figure 10. This figure presents the regional distributions of aquifer transmissivity (a measure of permeability) prepared from groundwater models as reported in Allen et al (1997), for which a transmissivity of 800m2/d has been inferred for the Chalk at depth beneath the site."*

Despite acknowledging the receptor importance as being high URS state the magnitude of potential impact as being medium with the significance after mitigation as having "*no impact*". However, URS site a potential pathway to contamination "*Through faults in the well cellars as a result of unidentified construction issues that provide a route through the cellar wall or around the junction between the cellar floor and the 13 3 / 8 " (340mm) conductor pipe into the underlying Chalk via a fault in the annulus cement seal." (URS, 2012a, p.24)* With a further qualifier *"Although due to the proposed drilling methods the likelihood of impact is considered low, it is greatest during the first stage of drilling through the Chalk aquifer. The proposed drilling method is designed to completely isolate the Chalk aquifer from the deeper drilling activities by the sealing of the first (outer) casing run. In addition, the use of water based drilling muds during all drilling phases will act to seal the borehole wall and limit any loss of fluid to the wider Chalk aquifer. (URS, 2012a, p.25)*

8.1.3 **Summary**

Despite a strong possibility of contamination to the East Yorkshire Chalk Aquifer occurring should the well leak, and in the full knowledge that "*some maintenance to remediate pressure in the well annulus*" *(Foster, 2012c, p.9)* had been undertaken prior to suspending the well no record can be found of Rathlin Energy or Yorkshire Water undertaking testing in the aquifer throughout the period of time the well was suspended.

The East Yorkshire Chalk Aquifer is a high transmissivity and low storage aquifer and any toxic contamination to the water table situated in the Chalk Layer from activities at West Newton A well site will pollute the main aquifer, particularly during periods of high demand or draught.

8.2.1 **Groundwater**

Groundwater has a diverse mineral character caused by natural reactions between water and rock. It is also recognised as being a "*high purity commodity"* which must be carefully monitored for deterioration through anthropological generated pollution. Groundwater quality changes swiftly as it travels through subsurface pathways within soil, the unsaturated zone and finally to the saturated zone of the aquifer therefore any pollutants in ground and sub-surface water will travel rapidly into aquifers. *(Edmunds, 2002)* A risk to surface and groundwater quality can arise either from the movement of existing pollutants or the introduction of new pollutants.

8.2.2 **Potential Contamination to Groundwater**

The Hydrogeological Risk Assessment *(URS, 2012a)* identified a number of potential sources of impact to ground and surface water in the vicinity of the site with methods of mitigating pathways. Possible contamination routes included:

- *"Leakage from the perimeter drainage system due to faults with its construction,*
- *Loss of foul or contaminated drainage from the site into surface water feature adjacent to the western site boundary or due to permeable shallow soils and hence groundwater seepage within soils to the adjacent surface water feature;*

(URS, 2012a, p.24)

Possible contamination pathways identified in the report included:

- *"Horizontal pathway from direct runoff from site to surface watercourse;*
- *Overtopping of perimeter drains and into surface watercourses;*
- *Failures in the impermeable membrane into shallow saturated soils and migration to surface watercourse;*
- *Fuel Oil spillage on ground and leakage of drilling fluid;*
- *Spillage onto site surface, to site drainage then via leaks in impermeable membrane or overtopping drainage system capacity."*

(URS, 2012a, p.24)

8.2.3 **Perimeter Drainage System**

Following well suspension in 2013 West Newton A was unmanned and no documented site visits to monitor the perimeter drainage system during the period between well suspension and the commencement of work on the second stage extended well test can be located.

During early May, following several days of rain, the perimeter drainage ditch overflowed to such an extent it was running into the ditch, alongside the compound, that feeds into the Lambwath Stream and its Site of Special Scientific Interest. Several telephone calls from concerned residents and Environmental Activists were made over a three day period to the Environment Agency before action was taken and a site visit undertaken. Following this Total Environmental Technology removed 3 tankers of water from the perimeter drainage ditch. *(Appendix 29)*

Pictures of perimeter drainage ditch prior to overflowing (May 2014)

8.2.4 **Groundwater Contamination; Concerns**

Following a number of complaints regular visits were made to West Newton A by the Environment Agency, resulting contamination pathways to groundwater concerns were officially highlighted to Rathlin Energy.

CAR 400996/0201777 dated 03 June 2014 stated "*A drilling rig for groundwater monitoring boreholes was present on the North boundary of site and was drilling outside of the area contained by an HDPE liner. Cuttings and water from groundwater borehole drilling were stored in a skip in within the contained area. Some run off of water and fines from the skip had entered the contained area drainage ditch. Some run off water and fines from the skip had entered the contained area drainage ditch. Water in the open section of the containment ditch on the West site boundary had suspended fines within it*.

The assurance "*Water from the containment ditch is to be tankered off site for disposal" (2014g)* was included the CAR.

However, prior to the Environment Agency inspection the perimeter ditch was being emptied into the drain by the entrance of compound. Given no testing of the water in the ditch had been seen to have taken place, and given the Environment Agency had noted fines, small particles of rock or other solids, from drilling activities were present in the water at the time of the inspection, it may be deduced that contaminated water had been introduced into the contained drain. *(Appendix 29)*

CAR 400996/0226673 dated 22 October 2014 found "*The open section of the perimeter containment ditch on the West boundary of the site was inspected… Some emulsified oil and iridescence were present on the water surface at the South end of the open section of ditch*." *(Environment Agency, 2014h)*

On 29 October 2014 CAR 400996/0223268 *(2014i)* raised further concerns about the disposal of contaminated water and the means by which Rathlin Energy were attempting to absorb surface contamination stating: "*Operator advised to review the disposal of ditch water. Current code 16 10 12 is only applicable to uncontaminated rain/surface water*".

"The operator should be able to demonstrate that future disposals under 16 10 02 are applicable as the ditch has the potential for including other contaminants which could potentially render it as disposal under a hazardous waste code".

"*The operator is using absorbents in an attempt to remove any potential oil contamination from the surface of the water, but the effectiveness of this is debatable"*.

On 03 November 2014 despite previous notices Rathlin Energy had still not resolved the issue of contamination in the perimeter ditch, however at this time Rathlin Energy were starting to wind down operations in preparation for well suspension with no public records available as to the preventative measures, if any, Rathlin Energy had implemented to prevent contamination to groundwater from the perimeter ditch.

"*The open section of the perimeter containment ditch on the West boundary of the site was inspected. Oil residue was present on the water at the South end of the open section of ditch and what appeared to be emulsified oil was present at the North end"*. *(Environment Agency, 2014j)*

8.2.5 **Equipment Inspection Failings**

Following an inspection of waste operation carried out by the Environment Agency on 03 June 2014 CAR 400996/0210777 *(2041g)* was issued to Rathlin Energy stating "*A fuel bowser for the drilling rig was incorrectly fitted with a direct drainage outlet in its bund that had a removable threaded insert. The bowser does not meet the requirements of the Control of Pollution Act (Oil Storage) (England) Regulations 2001.*

As the bowser was located on the HDPE containment area it was not recorded as a non-compliance. A loss of fuel from the bowser would have contaminated the aggregate surface and the containment ditch" *(Environment Agency, 2014g)*.

Rathlin Energy's Environmental Permit Application point 9.1.1 page 43 states "*A daily inspection of all tanks and other waste storage containers shall be undertaken to ensure they remain fit for purpose. The inspections will aid early identification of any potential release to site from equipment which deteriorates over time"*. *(Environment Agency, 2014g)*

It must, therefore, be concluded from the above that equipment coming onto the site was not being inspected to ensure that it met regulatory requirements; this was a management and procedural failure and contravened Rathlin Energy's Environmental Permit. It should also be noted that Environmental Activists reported, on more than one occasion, a '*rainbow effect'* on the surface of the water in the perimeter ditch indicative of oil contamination.

8.2.6 **Hydraulic Fuel Spill**

Page 10 of the Traffic Management Plan states "*Should mud or debris be carried onto the public highway from the West Newton Wellsite, then measures will be implemented to remove thi*s." *(Moorhouse, 2012b, p.11)*

In September 2014 a Total Environmental Technology tanker leaving West Newton A could be seen to be leaking fluid. Leaving a trail stretching from the compound entrance to beyond Marton Junction, with the worst of the leak being seen at Marton Junction adjacent to a pond that feeds into a ditch directly connected to the Lambwath Stream. This was later identified as hydraulic fluid and despite vigorous attempts to notify both the driver and the Police who witnessed the event no action was taken.

Photograph of hydraulic fluid leak (*September 2014*)

In order to mitigate potential pollution issues from hydraulic fluid leakage a mobile spill cleaning kit should be utilised, this incident is another example of at worst a flagrant disregard of the environmental impact this could have caused and at best a lack of knowledge regarding due process.

8.2.7 **Procedures and Processes**

Following an inspection of waste operations by the Environment Agency on 03 July 2014 CAR 400995/0214406 was issued. The report highlighted that no written records had been made of the discharge to surface water and perimeter ditch during the drilling of the water monitoring boreholes. *(Environment Agency, 2014k)*

Despite acknowledging the need for adequate training in order to comply with ISO 14001 Requirement 4.4.2 Competence *(Foster, 2013)* general inspections of containers were not undertaken by qualified and trained staff with all inspections recorded, rather the onus was placed on security staff to report leaking fluids or other occurrences with no written procedures or check lists in place to assist them. *(Environment Agency, 2014k)* The structure in place to identify training needs was clearly laid out with a stated "*Identification of training needs to develop the appropriate environmental competency*" in order that "*Environmental Hazard Identification and Reporting*" *(Foster, 2013, p.18)* was undertaken by staff confident they had been fully supported by Rathlin Energy in this essential area of pathway to contamination prevention.

Action 5 was an instruction to "*Create a management system instruction and checklist for security and train it out. Timescale 18 July 2014". (Environment Agency, 2014k)*

8.2.8 **Summary**

It was considered the greatest potential impact to the Chalk aquifer posed by the well site was likely to result from drilling activities, namely the release of turbid waters and/or associated contaminants to groundwater. However, what can be deduced from the above is that very few, if any, of the mitigation to contamination pathways laid out in the planning application were followed with diligence and due care and attention.

What is also known is the East Yorkshire Chalk aquifer is suffering from stress and Rathlin Energy's apparent complete dismissal of the aquifer under and around West Newton as seemingly irrelevant is extremely concerning. The aquifer can be drawn upon by the main Chalk aquifer supplying much of Hull and surrounding district. Should an incident have occurred which resulted in the contamination of the aquifer at Fosham leading to the polluting of the main aquifer the resulting impact would have left an enormous number of residents without access to clean water for a considerable period of time. The impact of water contamination on wildlife would literally be devastating to a fragile and diverse ecosystem that contains a considerable number of both legally protected and unprotected species of wildlife.

The concerns highlighted above left Environmental Activists and Residents feeling totally impotent in their ability to do anything to stop unsafe practices. The feeling of being side-lined and ignored by East Riding of Yorkshire Council and the Environment Agency has led to a total lack of confidence in the strategic structures supposedly in place to ensure that on-shore drilling activities are conducted under any sort of accountable standard let alone a gold one.

TRAFFIC MANAGEMENT

9.1.1 Traffic Management Plan

The Traffic Management Plan forms an integral component in the overall planning application. In order to minimise the impact of high volume vehicular movements it was stipulated a co-ordinated approach be taken by well site security staff and vehicle drivers. To enable this holding points for vehicles were established in the lay-by north of Coniston and at the lay-by on Langthorpe Road, New Ellerby. Communication, in the form of radios and mobile telephones were to be used by drivers and well site gate security ensuring adequate spacing between vehicles was maintained. *(Rathlin Energy (UK) Limited, 2013b)*

The Traffic Management Plan (*Rathlin Energy (UK) Limited*, *2013b, p.6*) clearly states "A*ny non compliance may result in the driver being removed from the project*"

David Montagu-Smith, CEO Rathlin Energy, said on the issue of traffic "*There'll be a period of time where there's no doubt we'll be causing traffic. We can't avoid that, but what we can do to mitigate the impact is have tightly controlled traffic Management plans". (Montagu-Smith, 2014)*

9.1.2 Access Route

A detailed access route to West Newton A is explicitly laid out in the Traffic Management Plan with the written validation "*HGV's and delivery vehicles travelling to the West Newton Wellsite must follow the specified route*". *(Rathlin Energy (UK) Limited, 2013b, p.6)* On Friday 22 August 2014 at 11:15am vehicles were seen travelling through the village of Skirlaugh in convoy to the site. This was not the first occasion well site traffic had been seen deviating from the designated route; that these vehicles were travelling to the compound cannot be disputed as they were fully monitored from Skirlaugh to the well site.

9.1.3 Vehicle Display Notices

Page 6, point 1 of the Traffic Management Plan *(Rathlin Energy (UK) Limited)* states "*All vehicles are to display the Rathlin Energy logo sign, included with this document, in their cab at all times when travelling to and from the site*". It was noted by Activists and Residents monitoring Rathlin Energy and their contractors that from the first vehicle arriving at the site to the last vehicle leaving it during the Extended Well Test not one designated notice was displayed.

Lorry leaving West Newton A

9.1.4 **Speed Limits**

On 06 August 2013 at the Community Liaison Meeting it was reported by Philip Silk, Planning Manager, Moorehouse Drilling and Completions, that the *"Traffic Management Plan was now in operation"*, this begs the question given that work had already started had the Traffic Management Plan not been operating on commencement of works?

Tom Selkirk, Project Manager, Rathlin Energy (UK) Limited, "*said that Rathlin had received feedback from a resident about a contractor's driving performance. Following an investigation, the driver concerned was removed from the project. He said that non-compliance of any kind is unacceptable to Rathlin Energy and said that all contractors had been told about their responsibilities to the local community". He also "said that Rathlin has a no tolerance policy with anyone or any organisation that breaks the rules. He said that measures have been taken and will continue to be taken to address all issues brought to the team's attention". (Rathlin Energy (UK) Limited, 2013a)*

Further reports had been made that at 14:00 on 06 August 2013 two residents had seen an *"orange truck"* travelling at an estimated speed of over 40 mph through Ellerby to the well site. Another Resident Representative reported as the drivers of the orange lorries *"look as though they need to be somewhere in a hurry"* and complained he had had a *"near miss of his own". (Rathlin Energy (UK) Limited, 2013a)*

Point 2 of the Traffic Management Plan states "*A temporary speed limit of 25mph for all drivers from New Ellerby to the well site; this must be adhered to at all times*." *(Rathlin Energy (UK) Limited, 2013b, p.6)*

In addition to the above complaints to Rathlin Energy at several of the Police Liaison Meeting organised by Humberside Police Force in 2014 similar complaints were raised that on numerous occasions' vehicles travelling to and from the compound had been seen by residents travelling at speeds well above the limit laid out in the Traffic Management Plan *(Rathlin Energy (UK) Limited, 2013b, p.6)* with many of these speeding vehicles breaking legal limits. Despite complaints no mitigating measures to counteract these noted incidents were put in place by Humberside Police who could, as a minimum, have allocated a temporary mobile speed cameras to constantly monitor traffic speeds during well site operations instead of on the one occasion.

9.1.5 **Vehicle Convoys**

Point 3 of the Traffic Management Plan states "*Trucks leaving the site after deliveries must leave in single order giving a 10 minute interval, when departing from site*." With Access Arrangements point 3.5 further qualifying this with "*At no time will vehicles be allowed to wait or queue along the designated access route*." *(Rathlin Energy (UK) Limited, 2013b, p.6)*

Tom Selkirk had reiterated at a Community Liaison Meeting "*only one lorry is allowed into and out of the site at a time and again this has been reinforced amongst all contractor organisations*". *(Rathlin Energy (UK) Limited, 2013a)*

During the extended well test at West Newton A a convoy could number up to forty plus vehicles at any one time, with an additional Police presence numbering in excess of 120 Enforcement Officers. Using the example of 02 July 2014 from 08:30am an extremely high Police presence could be seen in the villages of Ellerby and Marton. At just after 10:00am a convoy of heavy goods vehicles escorted by Humberside Police Force and accompanied by pick-up trucks, vans, four wheel drive vehicles and cars, some towing trailers, travelled from the A165 to the well site, it took approximately an hour and a half for the convoy to travel through the village of Ellerby. After having dropped off their loads at the site the convoy returned using the same route. Just after 13:00pm another convoy, using the same route, was escorted to the well site. The last vehicles to leave the compound travelled through Ellerby at 17:30. *(Broken Earth Productions, 2015)* Throughout the day Pipers Lane and Fosham road were closed with the roads through Marton and Ellerby gridlocked and neighbouring farmers unable to access their land. At no point during second stage testing did vehicles in convoy leave the site at 10 minute intervals.

9.1.6 **Policing of Vehicular Movements**

The question of the Traffic Management Plan being ignored was raised by Residents' at several Community Liaison Meetings with Rathlin Energy responding that they had not just ignored the agreed plan but that, in point of fact, Humberside Police Force had overridden the agreement negating any requirement for vehicles to follow agreed procedures.

At the Community Liaison Meeting held on 13 May 2013 PC Julie Turrell, Liaison Officer Humberside Police Force, "*said that there would probably be a slight increase in community policing patrols, but reassured residents that Humberside Police's objective is to ensure as little disruption to peoples' lives as possible. She explained that there would always be a proportional response to any reported issues. She said that her and her colleagues' role is the facilitation of a peaceful outcome for everyone". (Rathlin Energy (UK) Limited, 2014c)*

On 03 July 2014 Rathlin Energy further quantified these statements by distributing a letter to all households on the well site access route. The letter stated "*Humberside Police advised that the safest way to enable us to go about our lawful business was to send all of the equipment on to the site at West Newton in convoys*."

F-2014-01511 Response Final to a Freedom of Information request states "*Part:2 There are no recorded instructions given by Humberside Police to Rathlin Energy, therefore no information is held". (Humberside Police, 2014)*

At Police and Community Liaison Meetings it was highlighted that during the largest convoys there were 3 peaceful Environmental Activists living permanently by the compound with maximum camp numbers rising to 14 visiting Activists at various times throughout the duration of the camp. With visits at least three times a day from Police Liaison Officers (PLO's), Information Gatherers and several riot vans containing at least 6 Police Officers in each it became apparent to Residents and Activists any reports from the PLO's and Information Gatherers' to those in charge of Policing was being ignored. There was absolutely no need for such a high level of policing with road closures, the prevention of farmers working in their fields and the prevention of local residents supporting the camp from taking food and water to the Activists.

No satisfactory answer to the issue of over Policing was provided to Residents.

9.1.7 **Summary**

The fact the Traffic Management Plan appears to have not just been deviated from but totally ignored is a major cause for concern. It is indicative of the crass manner in which communities feel they have been treated, leaving them powerless as both the Council and Polices' apparent total support of Rathlin Energy at the expense of those who have resided in the locality for many years became obvious.

It is essential for residents whose homes are situated in villages that have designated traffic routes running through them to know those involved in decision making processes have the best interests of the community at heart. Many of the vehicles travelling to and from the site do not just carry above normal loads they also transport a range of hazardous chemicals and toxic waste fluids with the law of averages greatly increasing the chance of accidents.

When breaches to agreements laid out in planning applications take place there should be swift and uncompromising penalties imposed. This seemingly duplicitous treatment has increased feelings of impotency and frustration amongst communities. If, as residents of Holderness we had disregarded a planning agreement so unashamedly we would be called to account with the demand our transgressions be immediately rectified; it does not appear to be the same for Rathlin Energy.

ECOLOGICAL IMPACT

10.1.1 Background

In 1992 at the Rio Earth Summit 150 government leaders signed a convention on Biological Diversity. Coming into force in 1993 it was ratified by the majority of countries worldwide, including the United Kingdom, and *"is now a legally binding commitment to conserve biological diversity"*. *(Secretariat of the Convention on Biological Diversity, 2000)*

"Biological diversity is the resource upon which families, communities, nations and future generations depend. It is the link between organisms, binding each into an interdependent community or ecosystem in which all living creatures have their place and role. It is the very web of life. Despite its importance, our heedless actions are eroding this resource at a perilous rate. The world is impoverished, even threatened, by this loss. Every gene, species and ecosystem lost erodes the planet's ability to cope with change." In exploiting the environment for short-term gain the long-term interests of the planet and future generations are not being protected. *(Secretariat of the Convention on Biological Diversity, 2000)*

The Rural Strategy for East Riding of Yorkshire 2013 – 2016, Annual Refresh 2014/15, Point 6.1 states *(2014, p.23) "Protecting the East Riding's natural assets and habitats, and the species they support, remains a key local priority, overseen by the East Riding of Yorkshire Biodiversity Partnership and delivered through its Biodiversity Action Plan (ERYBAP). The ERYBAP seeks to identify, improve and create priority habitats. It also aims to improve connectivity between them, and thereby increase their ability to support a diversity of species over the longer term."* Point 6.2 continues *"The ERYBAP vision is to 'sustain, restore and create a thriving, vibrant and sustainable biodiversity network in which the priority habitats and species of the East Riding of Yorkshire can prosper".*

The role of landowners and farmers in having a major part to play ensuring the environmental protection of the land is covered under point 6.3; *"As 80% of the East Riding is farmland, agriculture continues to have a major influence over the environmental condition of the area. Farmers and landowners are major custodians of wildlife habitats and landscapes." (East Riding of Yorkshire Council, 2014, p.23)*

"Ultimately, the survival of species, including us, depends upon maintaining the biodiversity of life on earth. Humans have a responsibility to be careful custodians of biodiversity, not only for human related purposes, but also for the intrinsic value of biodiversity itself. This responsibility is one of the underpinning philosophies behind sustainable development so that humans safeguard existing biodiversity interests and repair human damage to biodiversity for the benefits of future generations". (East Riding of Yorkshire Council, 2010, p.2)

Local Biodiversity Priority areas incorporate Lambwath Meadows and surrounding area; the area is also encompassed in the River Hull Strategic Biodiversity Priority Landscape Targets. *(East Riding Yorkshire Council, 2010, p.20)*

A Phase 1 Habitat survey is conducted in order to map and record habitat types and vegetation. It is a minimum requirement for certain planning applications and is a relatively quick recording technique for wildlife habitat and basic vegetation in a parcel of land with target notes used to highlight particularly important features. As a study it is somewhat reliant upon desk top research and existing reports of protected species, however, it can provide a clearly defined baseline for monitoring change. *(Joint Nature Conservation Committee, 2008)*

In July 2012 a Phase 1 Habitat survey was undertaken by URS *(2012b)* and submitted as an essential part of the planning application for the construction of the well site and initial core drill at the site known as West Newton A. The report states the field study was undertaken in July during the optimum study period however, no time of day was given for the field study.

The report also states *"Fauna, including foraging bats and owls, may avoid any areas of light disturbance by utilising alternate habitats within the vicinity. Lighting levels during operation would include low-level safety lighting on site buildings that would be directed toward the ground and unlikely to significantly disturb nocturnal fauna in the vicinity. Significant 'exclusion' of nocturnal species is unlikely and no effects on the conservation status of fauna are expected to arise from temporary lighting effects. Therefore, no significant adverse effects on protected or notable flora and fauna are anticipated as a result of operational lighting. Confidence in this assessment is high. (URS, 2012b, p.9-10)*

10.2.1 **Hedgerows**

Historically hedgerows were valued as boundaries marking land ownership or for keeping livestock in or out of fields. Today hedgerows are valued not just as part of our cultural heritage or for establishing historical records but for the major role they have to play in preventing soil loss, reducing pollution, regulating water supply, reducing flooding and as a vital role for wildlife. Hedgerows are now recognised for conservation action and are included in the Biodiversity 2020 targets. *(hedgelink UK, 2015)*

Containing a mixture of woodland, scrub and grassland hedgerows are home to a wealth of diverse plant and animal species. "*They may also provide an important function in linking habitats in open farmland landscapes, thereby providing dispersal routes for species that cannot cross large open spaces." (Rich, et al, 2005, p.118)* Whereas a length of hedge between connecting hedges or other linear features is "*counted"* as a separate hedge, *"a hedgerow with a gap of more than 20m is considered to be two separate hedges." (Rich, et al, 2005, p.119)*

The Planning Application states: *"To allow the safe movement of vehicles in and out of the site, the access point will required widening. A 6m section of the hedgerow will need to be removed"*. *(Moorhouse, 2012c, p.28) "The removal of a very short section of this extensive roadside hedgerow is assessed to be a minor impact resulting in a minor adverse effect." (URS, 2012b, p.9)* This was further quantified with "*The extent of the hedgerow will be limited to minimise its loss. Its removal is considered negligible; however it should be noted that on completion of operations the hedgerow will be reinstated". (URS, 2012b, p.9)*

Measurements show that Rathlin Energy, in reality, removed 20 metres of hedgerow to allow for entry / exit; the original entrance to the field being 5.65 metres. The removal of the additional 14 metres means the hedgerows are now classed as being separate as oppose to conjoined and acting as a corridor. In consistently referring to the site as "*temporary"* thus having no significant effect on the ecology of the area the inference is the development will be rapidly reinstated to pre-test drilling status.

The Role of Local Wildlife Sites in the delivery of the East Riding of Yorkshire Biodiversity Action Plan places emphasis on the importance of ensuring corridors to allow wildlife movement are maintained, and cared for, with a "*need to conserve Priority Habitats and Species of principal importance for biodiversity in England". (East Riding of Yorkshire Council, 2010, p.7)*

In clearing over three times the original estimate of 6 metres of hedgerow Rathlin Energy invalidated the original assessment of the ecological impact on the area.

The lease on the site is for 25 years with an option for a further 25 years, therefore the hedgerow will not be reinstated for a potential 50 years leaving damage to the biodiversity of the area irreversible.

10.3.1 **Brown Hare**

During the past 100 years surveys show the brown hare has declined by more than 80% with some areas of the United Kingdom such as the South-West showing such low numbers it may be locally extinct. Although reasons for the decline are unclear it is thought predators, intensive agricultural and dairy farming along with massive hedge removal to facilitate the use of larger agricultural machinery, disease and poor nutrition may be major contributing factors.

Hares do not store food or hibernate therefore have a need to feed all year round; their dietary preference is for the wild grasses in winter and herbs during summer found under hedgerows. However, approximately 150,000 miles of hedgerows have been destroyed over the last 50 years depriving the hare of both food and shelter.

Although the brown hare has the ability to accelerate at 45mph a hare, when frightened, will '*sit tight'* to the ground when a predator approaches with the resulting consequence of death. Larger fields and bigger farm machinery has contributed exponentially to the decline of the brown hare with "*Thirty dead hares once found in a carrot field which had been sprayed with pesticide. They had 'sat tight' while the spray boom passed overhead and ingested the poison when they licked themselves clean." (Hare Preservation Trust, 2015)*

Despite the serious decline in numbers the hare is the only game species in Britain that does not have a closed shooting season, orphaned leverets are frequently found dead from starvation following culls.

The brown hare is listed by East Riding of Yorkshire Council in its Biodiversity Action Plan, Priority Habitats and states *"Inappropriately sited development can threaten valuable habitats and put species at risk of decline." (East Riding Yorkshire Council, 2010, p.39)*

Although URS state the area in and around the well site was suitable habitat for brown hares and, despite reporting no sightings from the Phase 1 Habitat Survey, they considered it unnecessary to carry out any further investigations, including a Phase 2 Habitat Survey. "*The current land use of the site provides suitable habitat for brown hare (Lepus europaeus), although no hares were observed during the site visit. However, this type of agricultural land is abundant and extensive in the immediate and wider local area. As the proposed development footprint only takes up a small part of this large field, no further investigations for brown hare are considered necessary." (URS, 2012b, p.6)*

During the second stage well test Residents and Activists reported frequent sightings of brown hares acting uncharacteristically; they were also seen running frantically across the compound in "*haphazard*" directions. *(Appendix 30)* Brown hares are timid creatures and there is no doubt the noise from the drilling rig and light from the towers would have disturbed and disorientated them.

Dead brown hare in the perimeter drainage ditch at West Newton A

10.4.1 **Bats**

In the United Kingdom all bat species and their roosts are legally protected under both domestic and international legislation. The relevant legislation being the 1981 Wildlife and Countryside Act, the Countryside and Rights of Way Act 2000, the Natural Environment and Rural Communities Act *(NERC 2006)* and the Conservation of Habitats and Species Regulations *(2010)*. If bats are found to be present in an area it is an offence not to comply with the law and penalties on conviction include up to 6 months in prison and forfeiture of items used.

The North and East Yorkshire Ecological Data Centre hold records from the 1980's of two pipistrelle bat sightings in the locality, however, as previously stated, the area has not undergone a full ecological assessment. The scope included in the Phase 1 survey is agricultural farm land with minimal human traffic and, as a consequence, highly likely any bats in the area would be sighted and, therefore, remain unreported.

Bats are the only true flying mammals and one of the most diverse mammals on earth with 16 native breeding species in the United Kingdom. However, during the past 20th Century bat populations have dramatically declined with the most common species, Pipstrelle, estimated to have fallen in numbers by 70% between 1978-1993. In the United Kingdom bats eat only nocturnal arthropods and changes in agricultural farming practice have resulted in fewer insects reaching adult, flying, age with the loss of habitat through fragmentation also a key threat to foraging bats. Hedgerows and ponds, both used widely by bats have disappeared at an alarming rate. *(Entwistle, et al, 2001)*

Bats are sensitive to anthropological induced environmental change and are unable to recover quickly due to low reproductive potential, reproducing once a year and typically only having a single pup, bats require high adult survivorship to avoid population declines. With the well being of the bat mirroring the well being of the environment the rapid decline in bat numbers reflects the rapid decline in the health of the environment. *(Entwistle, et al, 2001)*

Bats, although not blind, navigate and hunt using a sophisticated echolocation system. High frequency calls, outside of human hearing range, are sent out with the returning echo producing a sound picture of their surroundings. *(Entwistle, et al, 2001)*

During the Extended Well Test at West Newton A Environmental Activists and Residents noted that prior to the commencement of twenty-four hour drilling fairly high numbers of bats could be seen foraging in the area between the western hedge and the compound. Following the commencement of continuous drilling Activists noted the number of bats sighted dropped rapidly until none were seen at all with the odd one sighted behaving in an erratic manner. *(Appendix 30)*

Another strange phenomenon was noted by Activists on commencement of the Mini Fall-Off Test. Prior to the test large numbers of insects could be seen flying close to the lighting towers, however, on commencement of twenty-four hour drilling no insects could be seen at all. On checking with residents not directly impacted on from either noise or light pollution and who possessed outdoor lighting it was ascertained that insects could still be seen congregating in large numbers around their lights. *(Appendix 30)*

It can be deduced therefore, anthropological pollution from the sheer noise of the drilling rig adversely impacted upon both the food supply and the ability of the bats to use their echolocation system for foraging.

Bats are vital in terms of the ecological role they play as environmental health indicators as well as functioning as pollinators, seed dispersers and biological controls for nocturnal insects. In writing their conclusion to an in-depth study of the impact of Shale Gas development on the bat population Bat Conservation International state *“shale gas development contributes to water withdrawal and contamination, habitat loss and degradation, and the emission of GHGs resulting in detrimental effects on bat populations and their environment. Immediate action is required to reduce these adverse impacts”. (Hein, 2012, p.13)*

10.5.1 **Water Voles, Voles and Mice**

Arvicola amphibius, or water vole, is the largest species of the vole family in Britain. Inhabiting canals, rivers, streams, ditches, ponds and other wetland areas water voles are herbivores feeding primarily on the aerial stems and leaves of waterside plants during the growing season and the roots and bark of woody plants and the rhizomes, bulbs and roots of herbaceous species during the winter. Using a series of bankside burrows comprising many entrances and interconnecting tunnels the water vole's home is used for food storage, nest chambers and as a bolt hole from predators.

The breeding season is from March to October during which time the female becomes territorial, however the male will travel over his entire territorial range of between 60 metres and 300 metres and will have ranges that overlap with the ranges of other male and female water voles.

Water vole populations throughout England, Scotland and Wales have declined dramatically over the last 100 years with the biggest fall being noted over the last 30 years as a result of habitat loss and fragmentation and predation from the none native American Mink. As a species water voles are listed as being of least concern on the International Union for Conservation of Nature Red List of Threatened species as they are still common in many parts of Europe. However, they are a Biodiversity Action Plan priority species as well as being a Species of Principal Importance in England under Section 41 of the Natural Environment and Rural Communities Act 2006. Water voles are also fully protected under Section 9 of the Wildlife and Countryside Act 1981 which makes it and offence to:

- Intentionally kill, injure or take water voles;
- possess or control live or dead water voles;
- intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection;
- sell water voles or offer or expose for sale or transport for sale;
- publish or cause to be published any advertisement which conveys the buying or selling of water voles.

(Applied Ecology Limited, 2015)

URS *(2012b, p.6)* in their Ecology Report found that the "*water vole was identified to be present within the 1 km search radius of the site on Lambwath Drain (also referred to as Lambwath Stream), to which the ditch along the western and southern boundary is connected. In light of this, particular attention was made to inspecting the banks of the ditch for evidence of water vole. No evidence of water vole was recorded during the field survey, although given the timing of the survey the vegetation levels were high, obscuring part of the ditch. The ditch is considered sub-optimal for water vole, given that much of it entirely dry".* Residents and Activists are aware that the pond at the top of Pipers Lane, connected to the ditch running alongside the road is an ideal habitat for water vole; it is unclear if this area was considered in the URS Ecology Report *(2012b)* as it is not shown on Google Maps and was not included in the study area of the Phase 1 Survey.

During the Extended Well Test Environmental Activists were receiving reports from security staff that small animals were being poisoned. This was later confirmed by the Environment Agency *"The operator is carrying out vermin control on site using rodenticide in bait boxes and that is believed to be contributing to the numbers of small dead mammals found in the open section of the containment ditch." (Environment Agency, 2014m)* Some of the dead animals were being eaten by other animals prior to anthropological disposal of the bodies; this was later confirmed in a message to an Activist *(Appendix 7).* No public record can be found of Rathlin Energy submitting any recovered dead mammals to the correct public body for species identification. It was understood by Environmental Activists monitoring the site that dead rodents were mistakenly being dismissed as *"just mice";* this was later confirmed in a message. *(Appendix 7)*

It was also documented by Environmental Activists and Residents during the Extended Well Test over 200 rodents were seen dead in the perimeter ditch. This only happened during the Extended Well Test at other times, when there was no vibration or noise, no dead animals were seen in the perimeter ditch. From rodent behaviour noted at close quarter it has been deduced that it was not just the noise that disturbed them but vibrations in the ground disorientating them and causing them to run into the ditch. *(Appendix 30)* As the sides of the perimeter ditch are steep and smooth there is no escape route; pollution in the perimeter ditch was also an issue at this time. *(Environment Agency, 2014h)* The only record of dead species identification in public record that can be found came from the Environment Agency *(2014h)* who removed the bodies of a brown rat and a mouse, neither of which are protected under statute, from the perimeter drainage ditch.

Alarmingly what URS failed to take into account was the reach of noise pollution and underground vibration from the site caused by twenty-four hour drilling and the serious effect noise and vibration from the drilling rig / compressors would cause in eliciting unnatural behaviour in members of the rodent family. *(Appendix 30)*

10.6.1 **Birds**

Estimates for the total number of well pads required for commercial gas extraction is at present an unknown quantity. However, in 2014 Andrew Aplin, Professor of Unconventional Petroleum, estimated that in order to extract gas from the Bowland Shale in northern England it will require in excess of 5,000 drilling pads. In the Upper Bowland Basin alone this could, in practice, translate to up to 33,000 wells.

Very few European studies have been undertaken of the impact of on-shore drilling on the bird population as, on a large scale, it is a relatively new industry compared to other parts of the world. However, among the ecological risks linked to gas extraction noise, loss of habitat and habitat fragmentation are potentially the most serious. Twenty-four drilling compounded by hundreds of vehicle movement and the clearing of green-belt land for well compounds will impact on sensitive species far beyond the well pad footprint. *(Moore, 2014)*

The Phase 1 Survey *(URS, 2012b)* was extremely limited in its evaluation of the negative impact on the bird population from on-shore drilling. Looking at the footprint of the compound URS suggested that the *"Site offers a small area of habitat that is abundant in the locality and is assessed as being of value at the site level for breeding birds".* With a further recommendation *"that to protect birds, removal of* soils *and vegetation on site should, if possible, be carried out between the months of September – February to minimise disturbance to any nesting birds. If this is not possible then a search for nesting birds should be undertaken by an appropriately experienced ecologist prior to removal of vegetation and/or soils. Active nests should be retained and left undisturbed until monitoring confirms the nest is no longer in use"*.

"Operational noise levels are assessed as having only a minor temporary effect on nearby receptors. This temporary and highly localised increase in noise levels is very unlikely to have significant adverse effects on the conservation status of local fauna populations. Confidence in this assessment is high". (URS, 2012b, p.10)

The second stage Extended Well Test planning application paid only passing lip service to the ecology of the area with the noise and lighting management plans revolving around the impact to residents. However, previous studies on the effects of anthropological noise from high levels of traffic demonstrate that where there is a constant noise substantial decreases in the density of breeding birds takes place with up to 52% losses of birds within a 500 metre radius of the noise source as ambient noise levels increase *(Kasloo, 2015)*; the noise from Compressors and drilling rigs are low level with the sound travelling much further and having a greater impact on birds. The high levels of heavy goods traffic will also add to ambient noise levels. *(Moore, 2014)*

During the second stage Extended Well Test already high noise levels from twenty-hour drilling were greatly increased when the doors of the mud pump container were kept open in an attempt by on-site contractors and employees to mitigate overheating issues. *(Environment Agency, 2014f)*

Adult Barn Owls are extremely sedentary and regular in their habitats with a hunting range of approximately 1km in the breeding season and 3km in winter. *"Once settled into their home range (post fledgling dispersal) Barn Owls generally use the same nest and roost sites for the rest of their lives*". *(The Barn Owl Trust, 2015)* It is also documented by the Trust that Barn Owls feed in low light, open habitat and frequent preferred hunting areas.

URS *(2012b, p.4)* in their Ecology Report state *"There are no records of other notable species from the NEYEDC such as reptiles or barn owl within 1km of the Site".* However, The Barn Owl Trust has records of 6 pairs of nesting Barn Owls within 800 metres of the site. Within 250 metres of the site of the well lies their preferred hunting area and disturbances from noise, and more directly light pollution, prevented the Barn Owls from hunting and consequently feeding.

It was noted by Residents and Activists that on several afternoons in July and August the Barn Owls could be seen hunting during the day outside of their normal feeding hours but were not seen at dusk. This is a rare and is recognised as being due to starvation from a disrupted feeding pattern. When Barn Owls are hungry they will not breed. *(Wright, 2009)*

It was also confirmed by a Resident that Barn Owls were seen outside of their normal hunting territory. *(Appendix 31)*

For over fifty years studies have been undertaken into how homing pigeons and migrating birds find their way back, however it was not until 1997 that scientists made a breakthrough. On 29 June 1997 more than 60,000 homing pigeons were released in France; it was expected that approximately 95% of the released birds would find their way home; very few birds actually returned. Initially poor weather conditions were blamed, however, at 11:00 hours when the birds were crossing the English Channel, Super Sonic Transport was also flying across the channel to New York. As the supersonic plane flew the 100 Km ground width dimension boom carpet from the plane's Mach cone completely disrupted the orienting Earth sounds the pigeons were homing on. *(Hagstrum, 2013)*

Homing pigeons are reluctant to fly over large bodies of water as it thought the sound from ocean and lake surface waves obscure the earth's infrasonic signals. *(Hagstrum, 2013)*

"*Returning pigeons might at any point begin circling or flying back and forth (zigzagging) in order to check their orientation, and, if necessary, re-establish the homeward compass course*". *(Hagstrum, 2013, p.698)*

"Operational noise levels are assessed as having only a minor temporary effect on nearby receptors. This temporary and highly localised increase in noise levels is very unlikely to have significant adverse effects on the conservation status of local fauna populations. Confidence in this assessment is high." (URS, 2012b, p.10)

On Saturday 30 August 2014 at 16:40 homing pigeon in no obvious distress landed outside the compound area; Activists gave it water and fed it corn for forty-eight hours leaving it for twenty-four then feeding and watering it again. At least four times a day the pigeon tried to fly off, however it would circle the rig three or four times, fly in southerly direction and, on reaching the boundary of the compound, turn round and fly back; on several occasions it landed on the covered stack, however at the time the flare was not being used.

In early September 2014 on a day when all work on-site was temporarily suspended the homing pigeon circled the rig once and flew off.

10.7.1 **Great Crested Newts**

Great Crested Newts are listed on Appendix II of the Bern Convention and on Annexes II and IV of the European Union Natural Habitats Directive. It is protected under schedule 2 of the Conservation of the Habitats and Species Regulations 2010 and under Schedule 5 of the Countryside Act 1981.

In order to establish the presence of Great Crested Newts in an area a survey licence is required. Survey methodology for Great Crested Newts is most frequently based on confirming newt presence and population size in water bodies during the amphibian breeding period. The recognised survey window is from mid-March to mid-June and should involve well-spaced repeat survey visits of all suitable and accessible water bodies within the development site and off site up to 500m away. *(Langton, Beckett & Foster, 2001)*

"There is one record of great crested newt in the study area. The 1:25,000 Ordnance Survey map indicates that there is one pond within 500m of the site boundary, in a small wooded copse at Black Bush approximately 360m north-east of the site. The pond was not accessed for the purposes of the walkover survey as it lies outside the site boundary. Regardless of this, the mainly arable habitat within the site boundary does not provide suitable terrestrial habitat for great crested newts, although the mature boundary hedgerows may offer potential overwintering habitat. When considered in context with the extensive arable landscape and lack of other ponds in the wider local area, it is reasonable to conclude that great crested newt is unlikely to be present within the site boundary. On this basis, no further consideration is given to great crested newts." (URS 2012b, p.6)

The pond at the top of Pipers Lane is suitable habitat for great crested newts but from the above statement it can be assumed that the pond was discounted in the Phase 1 Survey. However, it is now also known that Beacon Security staff were trying to report finding great crested newts in close proximity to the compound. (*Appendix 7)*

10.8.1 **Summary**

The information collected in the Phase 1 habitat survey *(URS, 2012b)* only provided a snapshot of presence, absence, abundance and spatial distribution. Habitats are never static therefore, in many situations habitats and communities cannot be objectively or precisely defined and it is more appropriate to frequently monitor indicator species. Drilling was carried out over two separate periods with the full extent of the ecological impact as yet an unknown quantity as consistent and frequent monitoring of the area was not undertaken; this should be a mandatory requirement.

In discounting the north hedgerow as being "*sub-optimal",* not taking into consideration the pond at Marton Junction and with the recommendation "*no further study of the area should be completed"* URS failed to give proper due care and attention to the serious impact on-shore drilling would have on the biodiversity of the area. East Riding of Yorkshire Council, in not requesting a full Environmental Impact Assessment or a Phase 2 Survey, were derelict in their statutory duty to fully consider the East Riding of Yorkshire's Biodiversity Action Plan in giving permission for the development.

In not conducting an exhaustive desk-top and site survey of the area URS were completely negligent in their obligation to produce a comprehensive and accurate Phase 1 Survey. East Riding of Yorkshire Council Planning Department are equally negligent in their duty to ensure all documents are an accurate and a true reflection of the correct facts. In not requesting a full, and accurate, Phase 1 and 2 Survey and an Environmental Impact Assessment the Council, both elected and non-elected members appear to Residents and Activists complicit, through wilful ignorance, with Rathlin Energy and their seemingly incomplete and inaccurate reports.

HEALTH & SAFETY

11.1.1 Background

The Health and Safety Executive (HSE) is a non-governmental public body responsible for the regulation and enforcement of workplace health, safety and welfare. Part of the remit of the Health and Safety Executive is to investigates industrial accidents both large and small.

The Health and Safety Executive also monitors on-shore oil and gas exploration and development under the Health and Safety at Work Act 1974 and regulates the safety aspect of both well integrity and site safety. The Health and Safety Executive works in partnership with the Environment Agency and the Department of Energy and Climate Change in an attempt to ensure that any concerns are correctly addressed.

11.2.1 Hazard Substances

On 28 August 2014 the Environment Agency carried out a well site inspection of waste operations. During the visit two breaches to permit were noted, both under *"General Management"*; breach of permit 1.1.2, *"Staff competency/training"* and breach of permit 2.3.1, *"Management system & operating procedures". (Environment Agency, 2014f)*

"Inventory of substances stored on site
A copy of the inventory of hazardous materials on site was requested. The well site supervisor was able to access an inventory document inventory (sic) via an email on his mobile phone. Due to poor IT links at the site it took 15 minutes to forward the email to an on site laptop and print out the inventory.

The inventory did not have a date or version number and listed some materials that have been removed from site." (Environment Agency, 2014f)

Action 2: Make the hazardous materials inventory a controlled document as part of the EMS with a version number and date and update it to reflect the substances stored on site. Timescale 8 September 2014.

The COSHH store was inspected. It was not possible to inspect all the contents as it was being used to store a large number of empty plastic bags contaminated with product residue which were awaiting disposal. It was reported that these are to be transferred to an enclosed skip. The COSHH store will be inspected again during a future site visit. (Environment Agency, 2014f)

"Outside storage areas were also inspected.
The following substances were present which are not listed on the chemical inventory in appendix 5 of Waste Management Plan RE-05-EPRA-WN-005 Rev: 1.00 submitted as part of the permit application:

3 off empty 25kg cans of 'Brad-tech 6035' (stored on bunded pallet)
2 off 205 litre barrels of monethylene glycol (stored on bunded pallet)
2 off 205 litre barrels of methanol (stored in drip tray)" (Environment Agency, 2014f)

"Action 3: Confirm what these substances were/are used for on the well site. Timescale: 8 September 2014." (2014f)

No records can be located that show Rathlin Energy had complied with the Environment Agency's request.

Hazardous Substances – West Newton A

In April 2011 following an investigation to examine hydraulic fracturing in the United States the United States House of Representatives Committee on Energy and Commerce published *"Chemicals used in Hydraulic Fracturing"*. *"As part of that inquiry, the Committee asked the 14 leading oil and gas service companies to disclose the types and volumes of the hydraulic fracturing products they used in their fluids between 2005 and 2009 and the chemical contents of those products.*

Between 2005 and 2009, the 14 oil and gas service companies used more than 2,500 hydraulic fracturing products containing 750 chemicals and other components. Overall, these companies used 780 million gallons of hydraulic fracturing products – not including water added at the well site – between 2005 and 2009". (2011, p.1)

"The most widely used chemical in hydraulic fracturing during this time period, as measured by the number of products containing the chemical, was methanol. Methanol is a hazardous air pollutant and a candidate for regulation under the Safe Drinking Water Act." (United States House of Representatives Committee on Energy and Commerce Minority Staff, 2011, p.6)

11.2.2 **Summary**

From the above non-conformances it is clear Rathlin Energy were incorrectly managing the Control of Substances Hazardous to Health (COSHH). Had there been an emergency situation on-site staff would have been unable to correctly identify what substances were involved, the toxic level of the substances and therefore, how to correctly to deal with the situation.

Rathlin Energy included a chemical inventory and a health and safety proposal in their planning application. *(Foster, 2014)* Whilst it is acknowledged many of the substances listed were non-hazardous some were listed as hazardous. It can be argued, some of the substances listed are used, and found, in everyday life products it is the cocktail of mix being kept in the confines of a fairly small area that has the potential to be so dangerous. Some of the substances are classified as radioactive as well as explosive and toxic. *(Appendix 32)*

Failure to correctly document procedures indicates and ensure vital documentation is kept current and readily available shows serious deficiency in the management and control of hazardous materials; it also indicates unsatisfactory management, supervision and training of staff handling and the checking of on-site substances. Senior management may also be accused of being inadequately vigilant. Had an internal audit of the procedures for COSHH been undertaken it would have revealed the serious flaws in Rathlin Energy's checking, storing and recording system. It is strongly indicated that senior management failed to take seriously the correct management of the site, its documented control systems or the correct maintenance of those systems.

11.3.1 **Working at Height**

The Health and Safety Executive are responsible for ensuring safety in the workplace. In 2005 The Work at Height Regulations were brought into statute to prevent death or injury caused by a fall from height. "I*f you are an employer or you control work at height (for example facilities managers or building owners who may contract others to work at height) the Regulations apply to you.*

Employers and those in control of any work at height activity must make sure work is properly planned, supervised and carried out by competent people. This includes using the right type of equipment for working at height." (Health and Safety Executive, 2014, p.2)

On 06 October 2014 an on-site worker was filmed working at height on the drilling rig with no safety or arrest fall equipment. This incident was reported to the Health and Safety Executive on 07 October 2014. Following several Freedom of Information Requests regarding the incident the Health and Safety Executive report to be still investigating. *(Health and Safety Executive, 2015)*

IMPACT ON COMMUNITIES

12.1.1 The Planning Process

The Petroleum Act of 1998 gave all the rights to the United Kingdom's petroleum resources to the Crown with the government granting licences that confer exclusive rights to search for, drill for and extract petroleum to companies successful in obtaining a licence. Each licence is for a limited area and time. A Petroleum Exploration and Development Licence (PEDL) is granted by the government Department of Energy and Climate Change (DECC). PEDL 183, covering over 240,000 acres of Holderness was granted to Rathlin Energy on 01 July 2008.

In order to be considered for a PEDL the following basic criteria must first be met:

- *Having a staffed presence in the UK;*
- *Being registered at Companies House as a UK company;*
- *or Having a UK branch of a foreign company registered at Companies House*

(Oil and Gas Authority, 2012)

On 17 January 2008 Connaught Oil and Gas (Connaught) registered Rathlin Energy (UK) Limited with Companies House; Sunderland Holdings was registered in Jersey on 28 January 2008. This effectively meant Connaught, through Sunderland Holdings, could finance Rathlin Energy and obtain a PEDL.

There are three distinct phases in hydrocarbon extraction; exploration, testing and production. Each phase requires a separate planning application, however difficulties arise at the onset as each stage is classed as temporary, even though the life span of a well may be fifty years or longer; incidents giving cause for concern in work practice that have arisen in the first or second stages is discounted when objecting to later planning applications.

The following points will not be taken into account in deciding the acceptability of the development in planning terms:

- The reasons or motives of the applicant in applying for planning permission, for example if the development is thought to be purely speculative as in the case of Rathlin Energy undertaking exploratory or ‘Wild Cat’ drilling;
- Any profit likely to be made by the applicant;
- The behaviour of the applicant;
- Nuisance or annoyance previously caused by the applicant, unless this relates to an existing development for which retrospective permission is being sought;
- Concerns about possible future development of the site, as distinct from the actual development which is currently being proposed;
- Any effect on the value of properties.

In 2013 the Department for Communities and Local Development issued *"Planning practice guidelines for the oil and gas industry"* with an emphasis on community engagement and collaboration between all stakeholders. "*Pre-application engagement is a collaborative process between the prospective operator and other parties which may include: the minerals planning authority; statutory and non-statutory consultees; elected members; and local people. Each party involved has an important role to play in ensuring the efficiency and effectiveness of pre-application engagement." (Department for Communities and Local Development, 2013)*

With UKOOG stating in their community charter *"our aim is to foster open and transparent communications between industry, stakeholder groups and the communities in which we operate". (UKOOG, 2013a)*

In October 2012 Rathlin Energy submitted a planning application to East Riding of Yorkshire Council to construct and undertake a core drill at the well site known as West Newton A. In late November 2012 Rathlin Energy set up an exhibition in Aldborough Village Hall to inform residents of their plans. However, the hamlet of Ellerby, with it's two villages of old and New Ellerby, is situated much closer to Marton, with Old Ellerby most affected by heavy goods vehicles travelling both to and from the site. A much better choice of venue to host an information day would have been the Methodist Church at New Ellerby. The Church building is a central point for activities in the area with the trustees very amenable to their building being used in the best interests of the community; Rathlin Energy would have reached more of their target audience utilising this facility.

It should be noted in the village of Marton closest to the well site there are 10 residencies.

Of the six letters received by East Riding of Yorkshire Council in response to the planning application one was sent in querying whether a no fracking clause could be included in the planning permission, one objected to the industrialisation of the area with the other four all complaining about the lack of information on the date of the planning meeting and the general lack of information about due processes to the wider community.

"*As my property is closest to the proposed drilling well and having now read the recommended reasons for approval yet never having received any planning notification from East Riding Planning Dept.… I must explain that I have not intentionally taken a long time to comment but it was not made clear on the East Riding website as to when the Planning committee would meet as nowhere on the website does it explain there are three types of planning meeting i.e. a west an east and a strategic meeting and because I did not receive any planning intention notice through the post from East Riding Council it was only a day before the actual meeting that I was informed via the Hull Daily Mail as to when the case would be discussed by the Council". (Appendix 33)*

"I understand that a meeting was held on January 3rd to concentrate opinion regarding the application by Rathlin Energy (UK) Limited for full planning permission to bore for mineral exploration (petroleum) on Fosham Lane. I was not given notification of this meeting and was therefore unable to attend… I find the lack of notification to those throughout this village (apart from one recipient) regarding the meeting on January 3rd strangely coincidental, considering we are the people nearest to this proposed development. I was assured by David Montagu-Smith at the meeting held in Aldborough Village Hall on November 30th 2012 that I would be notified of the meeting to be held on January 3rd 2013

at County Hall Beverley. This did not happen although I left my name and address with your steward at the November meeting." (Appendix 34)

"It has come to my attention that the estimated number of heavy goods vehicles likely to be used in connection with this application has been increased from an initial 60 per day to 300 per day.

It takes little effort to realise the extra noise, pollution, wear and tear, driving hazard and congestion on narrow or/and, winding roads that will follow.

As this point has not been widely publicised I wish to object to the application. I would welcome an environmental impact assessment report carried out by an independent party.

Also. I am surprised the application was raised at the last planning meeting; I thought this was to happen later in the new year." (Appendix 35)

The one more worrying thing is that many of the local surrounding villagers don't seem to know anything about the proposed drilling site and what effect it will have on them." (Appendix 36)

The lack of public awareness about the development is also highlighted in a short documentary film. *(Broken Earth Productions, 2014)*

A Freedom of Information Request, 25 July 2014, enquiring as to dates and times of any visits to West Newton well site by East Riding of Yorkshire Council was made. The response shows that the Planning Officer, Mrs Ross, visited the site when the planning application was originally submitted by Rathlin Energy. The response goes on to state *"The officer has produced site notes and detailed Committee Reports when the planning applications at both Crawberry Hill and West Newton were being processed and these are available on line. No further monitoring reports have been produced by the officer". (East Riding of Yorkshire Council, 2014)*

In 2008 East Riding of Yorkshire Council refused an application for a temporary wooden chalet with a one floor elevation to be built on land south of Fosham Road (close to where the well site is now situated). Reasons sited for refusal of the application included: *"The application site lies in an area of land that is defined as open countryside where, in accordance with the policies of the Development Plan, new or temporary residential dwellings are only permitted where there is proven agricultural or forestry need or they constitute part of a rural diversification scheme. (East Riding of Yorkshire Council, 2008)*

12.1.2 Summary

When planning applications received by the local council for developments that have such a wide reaching and negative impact on local communities every effort should be made to ensure the community is fully consulted and aware of the impacts of the development. From the evidence above it is clear this just did not occur. In not being able to register an objection through lack of knowledge regarding the proposed development residents have implied consent through their inaction. The lack of knowledge regarding the development and the processes in place to be able to make their feelings known to East Riding of Yorkshire Council is also a breach of residents lawful rights to register their objection.

On-shore drilling is complicated with many specialist facets to the application and development. The local planning committee and officers do not have the technical knowledge to fully understand the processes and wide reaching impact of the development. Although specialists in certain areas are invited to comment on individual applications they are regional, or in some cases national, with many not responding or in the cases of those that do only appearing to have a macro or general understanding of impacts where as what is needed is micro knowledge with an understanding of all the issues such a development will bring at a local level.

Many of the reports submitted by Rathlin Energy were undertaken using desk-based research as oppose to full site-specific research of the area with repeated visits to gather information, this should be implemented as standard practice with site visits made by the council throughout the process so they also can begin to better understand the full impact of the development on the local communities they are supposed to represent.

How can it be possible for a planning officer with a general knowledge of planning regulations and law to produce full and comprehensive reports based on one site visit prior to any development work commencing and using evidence submitted by a company who have a vested interest in industrially developing an area; the council should be encouraging specialists from both sides of the argument, for and against the development, to submit reports and speak at planning meetings to ensure a more transparent and honest process and one that residents have more confidence in.

From the view point of Holderness Residents it seems totally illogical and frustrating that an unobtrusive one bedroomed low level temporary wooden chalet can be refused planning permission yet Rathlin Energy can put a well site with all the noise, light pollution and heavy traffic it has generated 300 metres from where the temporary dwelling was to be sited.

12.2.1 **Housing Impacts**

Although house prices fluctuate we generally think of house prices as increasing and as an asset to pass on to future generations. In early 2014 the BBC reported that house prices were expected to increase overall by around 5%.

A draft report issued by the Government body Rural Community Policy Unit, now incorporated into Department for Environment Food and Rural Affairs, states the *“Housing Impact”* will be “*negative but localised*” with *“house prices in close proximity to the drilling operations are likely to fall”*. *(Rural Community Policy Unit, 2014, p.4)*

One of the houses closest to the well site and most affected by noise pollution was sold during exploratory operations, the owner lost 13.85% on the asking price. Whilst this might seem small in percentage terms in real terms it amounted to over twenty-six thousand pounds.

The report then goes on to say, *“however, rents may increase due to additional demand from site workers and supply chain.” (Rural Community Policy Unit, 2014, p.4)*

Holderness is made up of small, rural communities with a lack of job opportunities, services and an ageing population in many of those communities. Many residents have been forced to leave the area in search of work, for those that have stayed many are reliant on the agricultural and tourism industry with the difficult of low wages putting the

renting or purchase of property out of reach. *(East Riding of Yorkshire Council, 2014a)* An influx of highly paid, short stay workers will exacerbate this issue as landlords get caught in the supply and demand cycle and charge much higher rents.

12.3.1 **Employment**

It was reported in the Draft Shale Gas Rural Economy Impact Report *(2014)* that the impact on jobs was *"Likely to be positive but uncertain impact as higher skilled jobs may be awarded to workers from outside local area. Although some supply chain businesses may recruit locally boosting rural employment".*

Rathlin Energy have a local address listed as Suite 4, Albion House, Albion Lane, Willerby, East Riding of Yorkshire, HU10 6TS with their head office address listed as London. Many of the services were obtained from Moorehouse Petroleum Limited in Bridlington with some local construction and fencing services also obtained locally. However, the better paid jobs were not accessible to local residents but rather contracted in workers from the continent or other parts of the United Kingdom who either rented accommodation locally or stayed for the initial core drill in a local guest house or subsequently further afield outside of Holderness. Total Environmental Technology who tankered away waste aqueous liquids are based in Driffield. However, the majority of jobs generated were low paid, zero hour contract security jobs with the Hull based company originally contracted to deliver the service replaced by Beacon Security, West Sussex who recruited the majority of the security staff from outside of Holderness with overall responsibility for security for the site provided by an existing employee who moved to the area when Beacon Security were contracted in.

The short termism of the services contracted in by Rathlin Energy brought very little, if any, financial or employment opportunities to those most affected by construction and drilling operations.

The land owner who agreed to the 25 year with an option for a further 25 years written in to the contract appears to be the only local resident to gain any financial long-term benefit from the operation and even that is debatable as the negative impact on his core business, farming, is as yet an unknown quantity.

12.4.1 Tourism

The impact on Tourism was reported in the Draft Shale Gas Rural Economy Impact Report *(2014)* to be "*Broadly Negative*" with "*Losses from tourists avoiding area due to shale gas operations may be off-set by increased hospitality to new workers".*

Within 1000 metres of the site lies the site of Special Scientific Interest, Lambwath Meadows and a network of registered footpaths connecting the small outlying villages. The area although previously very quiet and extremely beautiful with vast open skies, when not affected by light and noise pollution, is used by Ramblers, Residents, dog walkers and visitors to the close by Grade I listed Burton Constable Hall set in a park designed by Capability Brown. There are very few *"hospitality"* amenities in the area and the workers from the site infrequently used them.

The negative impact to tourism has the potential to be tremendous as fewer and fewer visitors come to stay in the area as the noise and traffic generated from drilling operations begins to heavily impact and this loss of income from visitors will not be off-set by those working on drill sites in the area.

CONCLUSION

Foreseeable future gas development in Holderness, based on what we know of Rathlin Energy's future plans and comparable formations in other parts of the world, suggests that under favourable economic conditions the one well at West Newton A will just be the start of many more to follow. The extraction process will bring with it a heavy industrialisation of the area with a massive increase in traffic, land disturbance, site activity, noise and light pollution. It will need the provision of equipment and material supply, warehouses, garages, chemical storage and distribution, increased gas production plants, pipeline distribution and waste disposal systems.

Widespread gas extraction and drilling of the area will also bring a permanent and irreversible compromising of sub-surface geological formations. With a persistent and ever growing number of small scale spills and contamination incidents greatly accumulating as thousands of fluid transfer and disposal activities begin, not to just negatively impact on one small area, but magnify to spread throughout the ground water and aquifer systems in Holderness.

The effects on an already fragile ecosystem will irreversibly change the biodiversity of the area and adversely impact on flora and fauna for many, many years to come.

Holderness is part of the bread basket of the United Kingdom with it's strong history of agriculture and farming forming the unique landscape of the area. This will all change. No consumer, manufacturer or supplier is going to want to buy produce from an area that is so heavily industrialised. Small business reliant on tourism will suffer as people stop coming to visit the area, there will be an influx of workers from outside the county increasing rental and purchase prices of homes and, if the boom passes as suddenly as it seems to be arriving, we, the residents of Holderness, will be left with a desolate landscape full of capped off well heads and previously rich, agricultural land unable to be farmed. Landowners and tenant farmers will loose their livelihood and generations to come will be denied the privilege of working on the land.

When we set out to write this report our intention was to present, in an objective and informed manner, the impact and work practices of Rathlin Energy. It rapidly became a labour of love; of the area, of the people who reside in the area, of the diverse ecology of the area and the sheer breathtaking beauty of the vast open landscape and skies.

When you have lived through the reality of what Rathlin Energy's drilling has done to the area and you understand that this is only the first of many wells they want to drill in our backyard, you feel overwhelming despair and frustration. Despair knowing, from the experiencing of just one well, the awfulness of what is to follow over the next fifty years, and beyond, unless we can, against all the odds, rise up as one, and stop it. The sheer frustration knowing that those making all the decisions that have so negatively impacted on our lives, whether at a regional or national level, actually do not care. They can have no understanding as they have just not lived through it.

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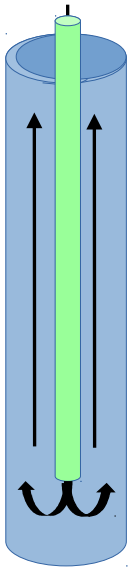
APPENDICES

Appendix 1 – *The Annulus of the Well*

Annulus in the mineral extraction industry is defined as any void between piping, tubing or the well casing and the piping and the tubing or casing immediately surrounding it. An annulus allows injected fluid to circulate in the well provided that excess drill cuttings have not accumulated preventing free flowing fluid movement and the possibility of the pipe sticking in the borehole.

Annulus of the Well



Blue area: Annulus

Arrows: Flow of fluid

During an initial core drill the annulus of the well is the void between the drill string and the formation being drilled. Drilling fluid is pumped down the inside of the drill string forcing any drill cuttings up the annulus to the surface where they are removed from the drilling mud by shale shakers.

Drilling fluid or mud is an integral part of the drilling process and serves, amongst other uses, to lubricate and cool the drill bit as well as to carry drilled cuttings away from the bore hole. Drilling fluids contain a mixture of various chemicals in either a water or oil based solution and are expensive to make. For alleged environmental reasons as well as to reduce the cost of the drilling operation fluid loss is minimised by separating the mud from the cuttings before the cuttings are disposed of.

A shale shaker is a primary solids separation tool. On return to the surface of the well the drilling fluid flows directly to the shale shaker for processing. Once the initial process has been completed the drilling fluid is then transferred to mud tanks where finer particles are removed.

Following completion of the core drill there are multiple annuli. The first annulus is the void between the production tubing and the smallest casing string. This first annulus serves a multiple of tasks vital to the extraction process, including gas lift and well kills. A ‘normal’ well will also have a secondary and frequently a third annulus between the different casing strings.

All annuli in the completed well should be isolated from any production tubing as well as each other, however connections allowing the flow of fluid between them can occur. These connections arise either because of wear and tear or an intervention.

During coiled tube interventions the void between the coil and the production tubing is also considered to be an annulus and can be used for circulation.

Coiled tubing refers to a very long metal pipe, generally 1” to 3.25” in diameter and comes ready spooled onto a large reel. It is used for a variety of interventions in both oil and gas wells; it can also be used in the production process in depleting wells.

Coiled tubing is often used to carry out operations similar to the process of wirelining. However, the advantage of using coiled tubing is that it has the ability to both pump and push chemicals through the hole as oppose to relying on gravity. Pumping using coiled tubing is also very much a self-contained, almost closed, system as the tube is continuous as oppose to having multiple joints.

Any operation using coiled tubing onshore is generally undertaken through a drilling or servicing rig or for smaller interventions a self-contained coiled tubing rig may be used.

The tool string at the bottom of the coil can be called the bottom hole assembly (BHA) and can range from a simple jetting nozzle to pump cement or chemicals through to a larger string of logging tools.

Coil tubing is used to perform open hole drilling and milling operations. However, it can also be used to fracture a reservoir, a process where fluid is pressurised to thousands of psi on a specific point in a well to break the rock apart and allow the flow of product.

It is said that if used correctly coil tubing can perform almost any operation for oil and gas well operations.

Coiled Tubing at West Newton A

Appendix 2 – *Transcript of a telephone conversation with UKOOG*

Date: 19 October 2015 Time: 13:24

REDEACTED UKOOG: Good Afternoon UKOOG

REDACTED Enquirer: Hello I wonder if you can help me? I am wanting to find out if a company are a member of UKOOG.

REDACTED UKOOG: We don't publish member's of UKOOG on our website but if you tell me the name of the company I will find out for you.

REDACTED Enquirer: The name of the company I am looking for is Rathlin Energy (UK) Limited.

REDACTED UKOOG: They are definitely a member of UKOOG. In January 2013 UKOOG changed its structure and became a formal organisation. Rathlin have been well involved since then.

REDACTED Enquirer: Thank you for you're help

REDACTED UKOOG: That's fine, if you need any more information please call back.

Appendix 3 – *Screenshot of links on Rathlin Energy (UK) Limited website*

Appendix 4 – *Transcript of E-mail 16 September 2014*

Sent: 16 September 2014 09:27
From: REDACTED *To*: REDACTED *CC*: REDACTED

Subject: RE: Rathlin Energy UK Ltd, West Newton Well Site, Environmental Permit BB3001FT

Hi

As I have previously stated, Rathlin Energy is taking these complaints very seriously and is taking appropriate steps to manage the odour from site. I am however concerned that the health effects stated by the complainants may not be the consequence of the odour coming from the site and any assumption or otherwise that it is, given that the distance quoted by the complainant and the likely dispersion of any small quantities of gas over such distance, could be detrimental to the well being of the complainants.

I have discussed the potential impact of small quantities of unburnt gas being vented at the well site with our specialist in the management of harmful gases, who has visited the site and experienced the odour. Whilst he and Rathlin Energy accept that there is an odour and the odour having the ability to travel some distance, our specialist does not believe the odour represents a risk to health. For the well being of the complainants, please can you confirm what, if anything the EA is doing independent of Rathlin Energy to substantiate the complaints raised by the residents of the properties in respect of health effects and whether consideration has been given to other potential sources within the area. This question has been raised by the Senior Management Team within Connaught Oil and Gas, parent company of Rathlin Energy (UK) Limited.

Kind regards,
For Rathlin Energy (UK) Limited

REDACTED

HSE & Planning Manager

Appendix 5 – *Transcript of E-mail 16 September 2014*

Sent: 16 September 2014 10:28
From: REDACTED *To*: REDACTED *CC*: REDACTED

Subject: RE: Rathlin Energy UK Ltd, West Newton Well Site, Environmental Permit BB3001FT

Thank you for your e-mails.

Officers from Environment Agency attended the area around West Newton Well site on Wednesday 10th September 2014 and Friday 12th September 2014 and on both occasions substantiated reports that the odour was present off site.

During the odour assessments the officers did not experience any of the symptoms described by the reporters of NIRS incidents 1277012 or 1277424. The officers' off site exposure to the odour was limited to a maximum of approximately 20 minutes.

Regards

REDACTED

Appendix 6 – *Transcript of E-mail 16 September 2014*

Sent: 16 September 2014 11:54
From: REDACTED *To*: REDACTED *CC*: REDACTED

Subject: RE: Rathlin Energy UK Ltd, West Newton Well Site, Environmental Permit BB3001FT

I am aware that the EA Officers visited the site and substantiated that an odour was present, Rathlin Energy is not disputing that an odour is associated with our operations, I am also pleased to note that the EA Officers did not experience any symptoms described in the complaints, nor, as mentioned have any of our well site crews (day and night shift), security officers or the police who attended site daily.

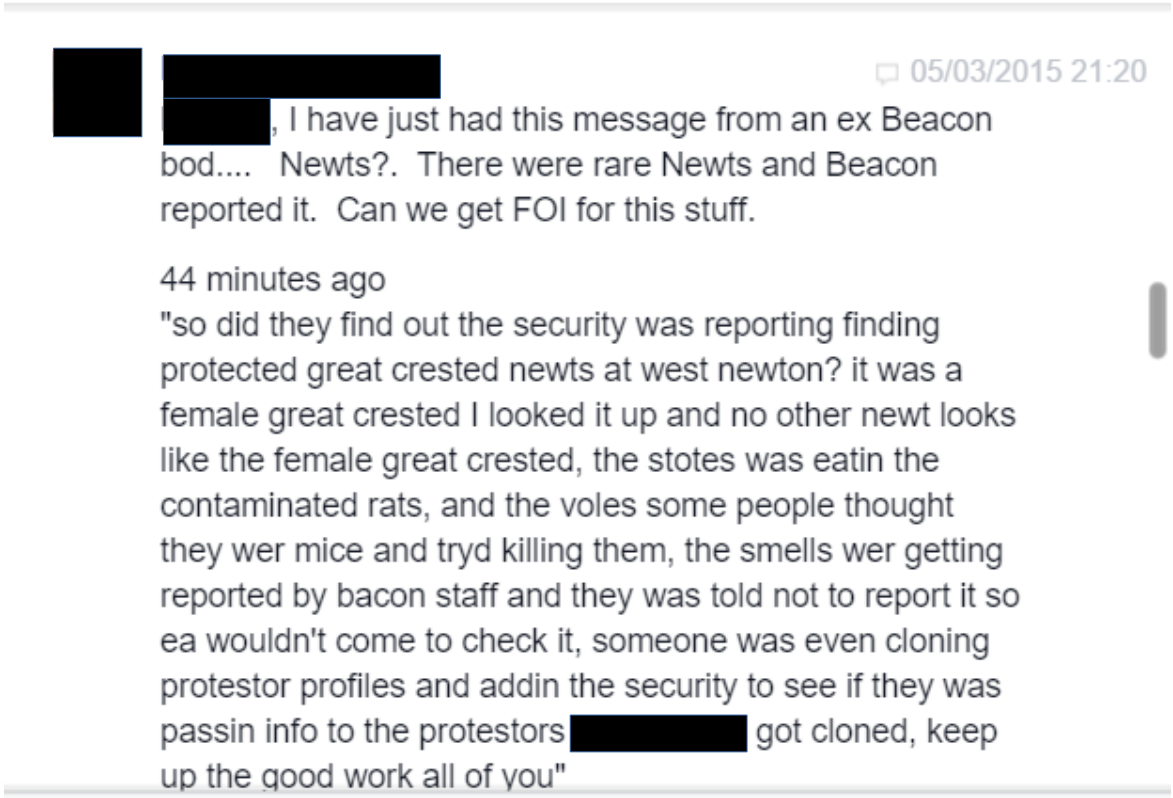
My question relates however specifically to the Complainant's health symptoms, whether anything has been done by the EA or any other agency to determine whether these symptoms are real and, if so, what has caused the symptoms. Rathlin Energy is conscious that an assumption that the health effects are a result of the unburnt gas from the West Newton Well Site could in fact mask a more serious and more local environmental or health and safety issue that is not related to our operations. Rathlin Energy has also been besieged with false allegations about its operations, both directly by protesters and by those they have co-opted locally as well as through the media. Again, I am conscious that this does not mask a more serious local environmental or health and safety issue.

Sorry to labour the question but such complaints do have a serious bearing on Rathlin Energy, in terms of our duty of care and moral obligations including staff, contractors, neighbours and other stakeholders that come into contact with our activities. Rathlin Energy has and will continue to work to protect the health and safety of anyone in contact with our activities and safeguard the surrounding environment.

Kind regards,
For Rathlin Energy (UK) Limited,

REDACTED

Appendix 7 – *Message from ex Beacon Security Employee*



Names have been redacted to ensure anonymity

Appendix 8 – *Transcript of E-mail 16 September 2014*

Sent: 16 September 2014 15:40
From: REDACTED *To*: REDACTED *CC*: REDACTED

Subject: RE: Rathlin Energy UK Ltd, West Newton Well Site, Environmental Permit BB3001FT

Further to our receipt of CAR 400996/0219962 dated 10/09/14, I have detailed below the methodology for carrying out sampling and analysis from atmospheric release of unburnt gas from the West Newton well testing operation. The methodology has been proposed by ESG, Rathlin Energy's air quality monitoring consultants. Since receiving the complaints the well has been shut in and the pressure monitored. Our intention is to flare the gas built up in the well to the point where the flare no longer has sufficient pressure to stay alight. We will then carry out a short cold vent of the residual pressure in order to obtain samples of the unburnt gas for odour analysis and monitoring. Prior to the start of this operation, personnel responsible for obtaining odour samples will be positioned at the locations detailed below. We anticipate this operation taken [sic] place later this afternoon or tomorrow morning, depending on receipt of approval from the EA to the methodology detailed below.

Action 1 and 2:

- All sampling will be undertaken using an Aspirator and Tedlar Bag. The Aspirator is a hand pump that draws air from the atmosphere into the Tedlar Bag. The Tedlar Bag contains a turn valve that allows air to be drawn into the Tedlar bag when open and prevents the air sample from escaping when closed. The valve also prevents external contaminants from entering after the air sample has been undertaken. When undertaking air sampling the Tedlar bags are to be filled until just under capacity. This assists in preventing the air sample from sticking to the inside of the Tedlar bag when under pressure and ensures a true analysis can be undertaken.

- A base air sample has been taken undertaken at the IBC containing Potassium Permanganate and at the flare stack. These air samples will be analysed by ESG to provide a base line level prior to the opening of the West Newton well.

- All air samples obtained will then be transported to ESG for analysis under laboratory conditions. The ESG laboratory is UKAS accredited and a copy of their certificated has been requested.

- Lab analysis will include Benzene, Toluene, Xylene, Mercaptans and Organo Sulpherous Compounds. Analysis results will be emailed to Rathlin Energy on completion.

- Release of brine into the 350 Bbls cylindrical tanks and gas emissions into the flare system will be recorded by site personnel and will be available for review.

Air sampling will be undertaken at 4 points identified by ESG during the commencement of operations and are identified below:

1. Base of flare stack.
2. IBC container of Potassium Permanganate.
3. Perimeter of the well site – dependent upon wind direction.
4. End of Pipers Lane / Fosham Road – or nearest sensitive receptor dependant on wind direction.

Action 3
An odour management plan is being drafted, which identifies the possible sources of the odour and the measures to be implemented to manage and minimise the risk of pollution from the odour. The analysis of the data we obtain from the initial odour sampling will influence the odour management plan.

I would be grateful if you can confirm that the above methodology is acceptable to the EA following which I will instruct the well site to commence the bleeding off of the well pressure.

Kind regards,

REDACTED

Appendix 9 – *Transcript of E-mail 19 September 2014*

Sent: 19 September 2014 10:02
From: REDACTED *To*: REDACTED *CC*: REDACTED

Subject: RE: Rathlin Energy UK Ltd, West Newton Well Site, Environmental Permit BB3001FT

We do not give health advice to people who report incidents. If they request health advice we tell them to contact their GP.

We have been in contact with Public Health England regarding the odour and will be in contact with them again when we see the results of the emissions monitoring.

The actions that we have asked Rathlin Energy to undertake are as a result of the odour detected by the officers of the Environment Agency on Wednesday 10th September 2014 and Friday 12th September 2014.

The language used by the reporters of incident NIRS 1277012 and N1277424 has not influenced the actions that Rathlin Energy have been asked to undertake.

The details of the incident reports were cut and pasted from our National Incident Recording System (NIRS) and emailed to you so you could see exactly what was reported to us. We have not taken any action to determine if the reported symptoms were imagined or not.

Regards

REDACTED

Appendix 10 – *Transcript of E-mail 19 September 2014*

Sent: 19 September 2014 09:25
From: REDACTED *To*: REDACTED *CC*: REDACTED

I need to undertake an environmental permit compliance inspection today at West Newton. We should be at site at approximately 11:00 hrs. I will be accompanied by my colleague REDACTED who has not been on site before.

Also, next week I am aiming to do a permit compliance inspection on Wednesday 24th September 2014 at approximately 10:00 hrs. I will be accompanied by senior colleagues from the Environment Agency as follows:
REDACTED.

Would it be possible to borrow one set of size 44” (or larger) fire retardant overalls for the visit.

Regards

REDACTED

Appendix 11 – *Transcript of E-mail 22 September 2014*

Sent: 22 September 2014 16:29
From: REDACTED *To*: REDACTED *CC*: REDACTED

Subject: RE: Environmental Permit Compliance Inspection, Rathlin Energy UK Ltd, West Newton Well Site BB3001FT.

Attachments: Rathlin Energy-West Newton-Odour Management Plan-200914 R2pdf. FAC 6455 (West Newton L46 05-3) Interim Report 22-09-2014.pdf

Importance: High

Please find attached a revised copy of the West Newton Odour Management Plan. The Revision 1 document sent to you this morning made reference to Natural Gas Liquids which is a term the industry uses to describe as 'heavy ends' which in certain states are liquid. The revision 1 document did not qualify in detail that, when produced, the constituents referred are in a gaseous state when sent to the flare. Any Liquids that are produced from the well are removed by the separator. I thought it was imported (SIC) to make this point clear.

WE have also included within Appendix 2 a further report we have received on the gas composition, which has been produced by EXPRO, Rathlin Energy well testing contractor. For ease of reference I have also attached the document separately.

Kind regards, For Rathlin Energy (UK) Limited

REDACTED

Appendix 12 – *Transcript of E-mail 22 September 2014*

Sent: 22 September 2014 16:29
From: REDACTED *To*: REDACTED *CC*: REDACTED

Subject: Rathlin Energy West Newton, Permit BB3001FT, Odour Management Plan.

We have received the following documents from Rathlin energy in response to actions 1-3 on the Environment Agency compliance assessment report (CAR) form 4000996/0219962 form 10/09/2014: West Newton Well Site Odour Management Plan (OMP) RE-05-WN-OMP001:REV2.00 ESG Analysis of Tedlar Bags for VOCs report West Newton ASC/16028 17th September 2014.

ESG Analysis of Tedlar Bags for VOCs report West Newton 2 ASC/16035 18th September 2014. EXPROP gas analysis report FAC6455/L46/05-3 22September 2014

West Newton Well site Odour Management Plan (OMP) RRE-05-WN-OMP-001 REV:2.00. (Response to Action3)

We approve section 10.1.4 of the odour management plan which details measures for the incineration of natural gas. No cold venting of any gas must take place. This includes gas with a high proportion of nitrogen.

We give interim approval to section 10.1.3 which details measure for scrubbing emissions, pending further assessment as set out in the attached document.

Other sections of the plan are not approved and need to be amended to set out the additional appropriate measures you will take. The plan is deficient in the areas set out in the attached document.

Comments and questions regarding monitoring that must be answered in the revised OMP are set out in the attached document.

The EA will confirm its agreement to re-commencement of operations at West Newton well Site if Rathlin Energy first confirms its agreement to carry out the actions below and commits to a time scale for each action.

Actions:

1. With regard to the EXPRO gas analysis report FAC6455 / L46/05-3 22 September 2014 confirm where and how the sample was taken, what type of container it was taken in, and the process conditions when it was taken.

2. Carry out air dispersion modelling of the impact of gas venting releases. This must include predicted environmental considerations at the site boundary and at sensitive receptors. Expro gas composition data from report FAC/6455 / L46/05-3 22 September 2014 and Expro flaring and worst case cold venting data from dates

when venting took place, including the 9th, 10th 13th and 18th September 2014, must be used.

3. Revise the odour management as set out in the comments on the attached documents must include clarification of odour monitoring and ambient air monitoring proposals and locations.

4. Provide a site specific protocol for MCERTS flow monitoring of a brine tank breather pipe when the tank is being filed with brine.

Regards. REDACTED

Appendix 13 – *Transcript of E-mail 23 September 2014*

Sent: 23 September 2014
From: REDACTED *To*: REDACTED *CC*: REDACTED

Subject: Rathlin Energy West Newton, Permit BB3001FT, Odour Management Plan.

Thank you for your response. I P gas analysis report FAC6455/L46/05-3 22September 2014

We confirm that we have subsequently spoken and we will provide the relevant information tomorrow morning when you attend the West Newton Wellsite.

Best regards,

REDACTED

Appendix 14 – *Transcript of E-mail 24 September 2014*

Sent: 24 September 2014 09:36
From: REDACTED *To*: REDACTED *CC*: REDACTED

Subject: Rathlin Energy West Newton, Permit BB3001FT, Odour Management Plan.
REDACTED,

Thank you for your e-mail in which you set out four (4) actions as a result of your review of the West Newton Odour Management Plan. I note that the Environment Agency will give its agreement for Rathlin Energy to recommence its operations having Rathlin Energy first provided confirmation that the actions will be undertaken, together with a timescale for completing each action.

On behalf of Rathlin Energy, I do confirm that Rathlin Energy will undertake the following four (4) actions and in a timescale as described alongside each action.

No	Action	Timescale for Completion
1	With regard to the EXPRO gas analysis report FAC6455/L46/05-3 22 September 2014 confirm where and how the sample was taken, what type of container it was taken in, and the process conditions when it was taken.	Wednesday 24th September 2014
2	Carry out air dispersion modelling of the impact of gas venting releases. This must include predicted environmental concentrations at the site boundary and at sensitive receptors. Expro gas composition data from report FAC6455/L46/05-3 22 September 2014 and Expro flaring and worst case cold venting data from dates when venting took place, including the 9th, 10th, 13th and 18th September 2014, must be used.	Monday 29th September 2014
3	Revise the odour management as set out in the comments on the attached document. This must include clarification of odour monitoring and ambient air monitoring proposals and locations.	Thursday 25th September 2014
4	Provide a site specific protocol for MCERTS flow monitoring of a brine tank breather pipe when the tank is being filled with brine.	Wednesday 24th September 2014

The Odour Management Plan will be updated to reflect the comments raised during your review of the document. The methodology will be implemented on site today (Wednesday 24th September 2014). The air dispersion modelling demonstrating the impact of the vented gas releases will be commenced immediately, however will take a number of days to complete and report. I have suggested Monday 29th September 2014 for completion of the modelling, however I am hopeful we can get this to you in advance of that date. I understand that, whilst it is important to get the air dispersion model completed and sent to

you as soon as possible, as this is retrospective it would not prevent us recommencing operations.

Having provided confirmation that Rathlin Energy will undertake the four (4) actions detailed above within their respective timescales, Rathlin Energy will seek the Environment Agency's approval to recommence operations whilst you are undertaking a site visit to the West Newton wellsite today (Wednesday 24th September 2014).

Kind regards,
For Rathlin Energy (UK) Limited

REDACTED

Appendix 15 – *Transcript of E-mail 24 September 2014*

Sent: 24 September 2014 16:34
From: REDACTED *To*: REDACTED *CC*: REDACTED

Subject: Rathlin Energy West Newton, Permit BB3001FT, Odour Management Plan.

REDACTED,

I confirm the Environment Agency's agreement to re-commencement of operations at West Newton.

With regard to Action 4 the timescale for the written site specific protocol will have to be extended, as following the site visit today I need to provide the monitoring contractor ESG with some information, which I will do 25/09/2014. I suggest a revised timescale for submission of the brine tank monitoring site specific protocol of 29th September 2014.

REDACTED

Appendix 16 – *Transcript of E-mail 25 September 2014*

Sent: 25 September 2014 12:52
From: REDACTED *To*: REDACTED *CC*: REDACTED

Subject: Odour complaint today regarding the Rathlin Energy West Newton. BB3001FT

The environment Agency received an odour report today regarding the West Newton Well Site. Details below.

NIRS report 1281178 reported 25/09/2014 11:26 hrs

'NE Odour Complaint, Rathlin Energy, Hull'

The caller rang with regard to the odour from the above company. They are based on the site and the odour last week was horrendous.

When the site closed down, the odour disappears. However, they have commenced operations today it flared 20 minutes at 11:00.

"The odour was described as gas and very, very pungent. The odour comes and goes with the wind, but when it comes it is extremely pungent. The wind is blowing away from the village in a north, north east direction, rather than south last week. The smell came back when the flaring started".

We expected that the flare would combust the odorous components in the gas. If the flare was operating for 20 minutes we expect the flare combustion chamber to be up to temperature. Please can you investigate if the flare was operating correctly over the 20 minutes period and report back. Also please advise if an odour of the type released during the 20 minute period is expected to be released during the 5-10 days of continuous flaring.

Regards,

REDACTED

Appendix 17 – *Transcript of E-mail 25 September 2014*

Sent: 25 September 2014 13:30
From: REDACTED *To*: REDACTED *CC*: REDACTED

Subject: Odour complaint today regarding the Rathlin Energy West Newton. BB3001FT

Thanks for the report. I was expecting you to receive a complaint irrespective of whether there was any odours or not. Can you clarify the section highlighted in yellow below. Not sure if the report is referring to the person reporting the odour is based on site or that it is the company that is based on site.

I have been in constant communication with the site and, as I discussed this morning we did flow the well at 10:10. Please see report we have received on site following up on my report of the EA complaint.

I have confirmed with the Aereon flare supervisor that during the 20 minutes of flaring that the temperature the flare was operating at was within the range 1100-1250 degrees centigrade. The temperature range provides the ideal combustion of the gas within the flare unit. I can also state that the flaring commenced at 10.10 hrs and finished at 10.30 hrs and not 11.00 as stated in the complaint.

To determine if odours identical to last weeks were being emitted, personnel within the site personnel were deployed strategically around the entire site to monitor any odours from the operation.

I was at the flare stack with the Aereon supervisor and REDACTED was in attendance for the majority of the operation. There was at no time any reoccurrence of the odour emitted last week. The only detectable odour was from the combustion of gases during the incineration process and these were intermittent.

REDACTED discussed odours with the Environment Agency yesterday and informed them that there would be odours from flaring as this could not be eliminated as it is a product of flaring. He also informed them that the odour would not be anything like the odour that occurred last week.

Will continue to monitor this and report back.

REDACTED

Appendix 18 – *Transcript of E-mail 25 September 2014*

Sent: 25 September 2014 13:47
From: REDACTED *To*: REDACTED *CC*: REDACTED

Subject: RE Odour complaint today regarding Rathlin Energy West Newton. BB3001FT

All of the text provided is as recorded by the EA incident communication service. I read it that the company is based at the site. I have spoken to the reporter who stated that the odour reported was detected at an off-site location on Fosham Road.

Regards.

REDACTED

Appendix 19 – *Transcript of E-mail 25 September 2014*

Sent: 25 September 2014 13:51
From: REDACTED *To*: REDACTED *CC*: REDACTED

Subject: RE Odour complaint today regarding Rathlin Energy West Newton. BB3001FT

OK REDACTED Our team on site are very aware or the sensitivity and are monitoring to substantiate the complaint.

Will update you further as an (SIC) when

REDACTED

Appendix 20 – *Transcript of E-mail 25 September 2014*

Sent: 25 September 2014 13:58
From: REDACTED *To*: REDACTED *CC*: REDACTED

Subject: Proposed pre-abatement monitoring of emissions. Rathlin Energy West Newton BB3001FT

Re: the proposed pre-abatement monitoring of emissions from a brine tank vent, and from the combined pressurised water tank vent/atmospheric water tank vent.

We advise that flow monitoring and sampling at each point is carried out to MCERTS standard. Samples should be taken from the vent line when the tanks are being filled. The following information should be recorded. Pump rate to tank, gas temperature, separator pressure (for monitoring of the combined pressurised water tank vent/atmospheric water tank vent only). We advise that sampling and analysis for the following be included:

There followed a list of chemicals.

Regards

REDACTED

Appendix 21 – *Transcript of E-mail 25 September 2014*

Sent: 25 September 2014 14:02
From: REDACTED *To*: REDACTED *CC*: REDACTED

Subject: Proposed pre-abatement monitoring of emissions. Rathlin Energy West Newton BB3001FT

REDACTED I will forward this now to REDACTED at ESG. He has already provided a preliminary Site Specific Protocol in accordance with MCERTS, however, is expecting to receive this information in order to finalise it.

Many thanks again,

REDACTED

Appendix 22 – *Transcript of E-mail 25 September 2014*

Sent: 25 September 2014 14:30
From: REDACTED *To*: REDACTED *CC*: REDACTED

Subject: RE Odour complaint today regarding Rathlin Energy West Newton. BB3001FT

We have just finished the second bleed off and flaring of the well. Flaring commenced at 13:50hrs and finished at 14:03hrs.

The odour from incineration was less noticeable.

Pressure built up slowly to around 160 psi after the well was shut in.

Kind regards,

REDACTED

Appendix 23 – *Transcript of E-mail 25 September 2014*

Sent: 25 September 2014 14:38
From: REDACTED *To*: REDACTED *CC*: REDACTED

Subject: RE Odour complaint today regarding Rathlin Energy West Newton. BB3001FT

Thank you for the update.

The EA was also notified by the reporter of the earlier incident.

Regards

REDACTED

Appendix 24 – *Transcript of E-mail 25 September 2014*

Sent: 25 September 2014 15:11
From: REDACTED *To*: REDACTED *CC*: REDACTED

Subject: RE Odour complaint today regarding Rathlin Energy West Newton. BB3001FT

Yes, I suspect it will continue to be the case.

By way of an update, we are unlikely to flaring again today. (Sic) The previous two attempts to flow the well were on the basis of the natural build up in pressure from the formation. We will now set up to pump nitrogen which will take us up to tomorrow morning before we are back at attempting to flow the well again.

This is the trouble with exploration, you never know the characteristics of the formation until you test. Some take no time at all to deliver constant flow, whilst others such as this well take time. I guess that's better (for us anyway) than drilling a well and having nothing to test.

Kind Regards,

REDACTED

Appendix 25 – *Transcript of E-mail 25 September 2014*

Sent: 25 September 2014 16:44
From: REDACTED *To*: REDACTED *CC*: REDACTED

Subject: RE Odour complaint today regarding Rathlin Energy West Newton. BB3001FT

Further (sic) update. We have progressed well this afternoon, which in turn, puts us in a position to attempt to flow the well sooner than expected. The well is showing encouraging signs of potential unsupported flow and it is important we keep up the momentum if we are ever to resolve the matter. We will therefore be flowing the well overnight.

As we are getting towards evening, it reminds me that I sent over to you the reason why we have a short duration flame visible during the initial start of flaring, when the operator adjust the flow rates of gas and air to achieve optimum burn efficiency. I want to check that you are happy with this. I intend to get a video of the flaring operation (from a safe distance) to demonstrate this. I will forward this to you tomorrow.

Please confirm receipt of this e-mail by return.

Kind regards,

REDACTED

Appendix 26 – *Transcript of E-mail 26 September 2014*

Sent: 26 September 2014 08:39
From: REDACTED *To*: REDACTED *CC*: REDACTED

Subject: RE: Rathlin Energy West Newton, Permit BB3001FT Odour Management Plan
Rathlin Energy-West Newton-Odour Management Plan- 240914 R (Issued)

Please find attached a revised Odour Management Plan for the West Newton wellsite, which captures the comment raised following the Environment Agency review of the original submission and your conversation with the Rathlin Team during your site visit on Wednesday of this week. You will note and are aware that additional information is still outstanding to fully complete the plan, which is being compiled by our consultants. The MCERTS protocol for monitoring at the breather tanks should be ready today. I will forward that to you when I receive it.

Kind regards,
For Rathlin Energy (UK) Limited

REDACTED

Appendix 27 – *Transcript of E-mail 17 October 2014*

Sent: 17 October 2014 17:45

From: REDACTED *To*: REDACTED *CC*: REDACTED

Subject: RE *Rathlin Energy West Newton, Permit BB3001FT Odour Management Plan*
Attachments: West Newton-Odour Management Plan- R1 171014.pdf

Please find attached new version of the odour management plan for West Newton, adopting the risk management format. We have presented by way of sequenced events from initial workover (well and circulation tanks) and more specifically the well testing, which has been the main activities when the odour has been present.

The plan is supported by the SSP's and site plans, all of which you have. A copy of this document will be available on site, together with the supporting SSP's and plans. We will continue to review the OMP.

Certainly agree, it is a much simpler way of presenting information.

Kind Regards,

REDACTED

Appendix 28 – *Table of Odour Complaints*

Foul odour complaints emanating from West Newton 1 well site, Pipers Lane, High Fosham, East Yorkshire, HU11 5DA.

Data supplied by Environment Agency.

Table 1: Odour Complaints, West Newton 1

Date Reported:	Post Code of Report Location:
09 September 2014	HU11 (1)
10 September 2014	HU11 (1)
12 September 2014	HU11
14 September 2014	HU11
18 September 2014	HU11
18 September 2014	HU11
25 September 2014	HU11
26 September 2014	HU11
29 September 2014	HU11
30 September 2014	HU11
05 October 2014	HU11
15 October 2014	HU11
16 October 2014	HU11
17 October 2014	HU11
20 October 2014	HU11
24 October 2014	HU11
29 October 2014	HU11 (2)

Note 1: Odour reports recorded in The Environment Agency Compliance Assessment Report of 10 September 2014 as a result of an investigative visit to West Newton Well Site following complaints.

Note 2: Odour report supplied by resident; Environment Agency Reference 1290425.

Appendix 29 – *Transcript of Statement from Environmental Activist*

Name: REDACTED Address: REDACTED

Date: 26 August 2014

I hereby give testimony that when I arrived at the West Newton fracking site on May 11th 2014 the trough which contained the run off water from the hardcore pad was full and overflowing onto the track on the other side of the fencing where we made camp. So the water made the track have pools of water which we had to wade through to access our compost toilet and my dog was wading through and drinking.

We on camp had to call Rathlin the drilling company 3 or 4 times over the next few weeks to come and empty the trough. They were not doing regular inspections and never completely emptied it, so if it rained overnight it would be overflowing again the next day.

After work began to drill a water testing borehole, I saw a man testing the water in the trough. He was dipping it with a container to draw off some water and slipped on the hardcore on the edges and fell in up to his waist.

When they came to empty the water from the trough, they pulled out a plug, located under a slab of concrete and let the water run down the drain located on the site entrance by the fencing on the right. My van was parked over this drain.

When the water borehole on the left hand side at the front of the site, (when standing at the gates looking in) was being drilled, there was a blow back of water, which washed over the pad and ran out of the front gates and down onto the public road.

We reported this to the Environment Agency and the next day all work halted, and over 100 police in vans closed off all the lanes in the area to prevent any one travelling by road to the site and tankers were brought into the site to drain the water from the trough and deal with water escaping from the borehole being drilled. So for some reason the water was no longer allowed to off through the plug hole and down the drain as before.

This is an honest account of what I witnessed at the West Newton site.

Yours sincerely: REDACTED

Signature witnessed by: REDACTED

Appendix 30 – *Transcript of notes from a diary kept by Environmental Activist*

Name: REDACTED Address: REDACTED

Date: 05 December 2014

04 September 2014 – 05 September 2014 23:05 – 13:44
Late afternoon it was noted that there were 2 dead mice/voles in the run off ditch.

Late evening Drill Rig Worker shouted over "*You wont get any fucking sleep tonight".*

Pump/rig running from late evening and continuing into the night. The mouse living inside the tent I was sleeping in alongside the compound began making a high pitched screaming noise when the rig started up. It was noted that, unusually there were no moths/insects flying around the lights, on a night when the pumps aren't running there are moths/insects in the hundreds. Also the behaviour of the bats was unusual. Where there used to be lots of bats at night tonight the only bat I saw was disorientated, flying around in circles over the kitchen area of the camp; we had no external lights on as the light from the compound continues to flood over the camp.

05 September 2014
09:15 Brown Hare seen running across the compound in a haphazard manner
09:30 Ground vibrating under the kitchen floor
11:00 17 mice or voles dead in ditch + 1 Black beetle (not seen any since beginning of July)
1 Dead Vole found near the perimeter fence

18:00 Checked with REDACTED whilst he was visiting he said that he still has large numbers of insects/moths flying around his outside light. Weather was not wet or particularly cold for the time of year.

Birds seen in the area today
Goldfinch – nesting in the hedge, Tree Sparrow, Yellow Hammer, Bull Finch, Black Bird, Starling, Chaffinch, Dunnock, Jackdaw, Long Tailed Tit, Robin, Kestrel, Oyster Catcher, Lapwing, Red Shank.

06 September 2014
At around 3am a large amount of geese stopping over at Lambwath Meadows all flew simultaneously in the air 'screaming'. They flew round and round erratically whilst making a horrendous noise. It was so upsetting to witness this uncharacteristic behaviour.

Appendix 31 – *Transcript of a letter from a Concerned Resident*

To: REDACTED Address: REDACTED

Date: 25 August 2014

To Whom It May Concern

I am a lady living in New Ellerby East Yorkshire and have done so for the past fourteen years.

I moved from the City for a quieter way of life, community spirit, wildlife and a better general environment, but unfortunately this is being eroded away very quickly.

I was on my way home about 8pm one night at the beginning of August and was shocked to see a Barn Owl on the side of the road in daylight just past Burton Constable Hall and again further along a week later. I have never seen this before on my regular journeys' using this road.

My home outlook has already changed with emergence of the Wind Turbines now if that is not enough a Rathlin drill site, thirty plus tankers and police presence going by my front door. As the wildlife are not able to complain they certainly seem confused. How long before they disappear altogether?

Yours sincerely

REDACTED

Appendix 32 – *List of Hazardous Substances*

Product Name	Hazard	Composition / Formation of Ingredients
Bentonite Ocma	Inhalation	Bentonite 80-95%. Quartz, Crystalline Silica 2-15%.
Caustic Soda	Corrosive	Sodium Hydroxide Solid 60-100%
Citric Acid	Irritant	Citric Acid 60-100%
Lime	Irritant	Calcium Hydroxide (Lime) 60-100%
M-I Barite	Inhalation	Barite 91-93%. Silica, crystalline, quartz 1-11%. Mica 1-5%
Safe-Carb 40	Inhalation	Calcium Carbonate 60-100%, Quartz, Crystalline silica < 1%
Safe-Carb 250	Inhalation	Calcium Carbonate 60-100%, Quartz, Crystalline silica < 1%
Safe-Carb 500	Inhalation	Calcium Carbonate 60-100%, Quartz, Crystalline silica < 1%
Safe-Carb1000	Inhalation	Calcium Carbonate 60-100%, Quartz, Crystalline silica < 1%
Safe-Cide	Toxic	Triazine(2H,4H,6H)-triethanol 50-100%. Glycine 1-5%
Safe-Core	Irritant	Formaldehyde, Reaction products with Ethanolamine 10-30%
Safe-Scav HSB	Toxic	TRIETHANOL 30-60%. Water 30-60%. Aminoethanol 1-5%
Safe-Scav NA	Toxic	Ammonium Bisulphate 30-60%. Water 30-60%
Soda Ash	Irritant	Sodium Carbonate 60-100%
Portable Fuel Caddy	Harmful En	Petroleum Hydrocarbons >99%
Rig Fuel Tank 1	Harmful En	Petroleum Hydrocarbons >99%
Rig Fuel Tank 2	Harmful En	Petroleum Hydrocarbons >99%
Acetylene	Ex Fl Exp	CAS no 74-86-2
Argon	Asphyxiant	CAS no 7440-37-1
Hydrogen	Ex Fl Exp	CAS no 1333-74-0
Nitrogen	Asphyxiant	CAS no 7727-37-9
BOP Accumulator (Pre Charged Nitrogen)	Asphyxiant	CAS no 7727-37-9
Oxygen	Oxidising	CAS no 7782-44-7
Engine Oil 15W40	Tox Aq	Zinc alkyl dithiophosphate 1-2.4% Interchangeable low viscosity base oil 0-90%
Shell Omala 220 Gear Lub	Fl Tox Aq	Amine Phosphate 0,10-0,50%
Shell Omala S2 G 100 Gear Lub	Fl, Ac Tox	Amine Phosphate 0,10-0,50%
Engine Oil 15W40	Tox Aq	Zinc alkyl dithiophosphate 1-2.4% Interchangeable low viscosity base oil 0-90%
Shell Omala 220 Gear Lub	Fl, Ac Tox	Amine Phosphate 0,10-0,50%
Shell Omala S2 G 100 Gear Lub	Fl, Ac Tox	Amine Phosphate 0,10-0,50%

Cord, detonating - XHV,HMX, 80gr Det cord	Explosive	CAS no 78-11-5
Components, Explosive Train, N.O.S.	Explosive	CAS no 78-11-5
Detonators, Non-Electric, for blasting	Explosive	CAS no 78-11-5, 121-8-24, 13424-46-9, 15245-44-0, 1314-41-6, 7722- 64-
Detonators, electric for blasting - RP880 EBW Fluid Des Detonator	Explosive	CAS no 78-11-5, 121-8-24, 13424-46-9, 15245-44-0, 1314-41-6, 7722-64-7
Cord, detonating - XHV,HMX, 80gr Det cord	Explosive	CAS no 78-11-5, 121-8-24, 13424-46-9, 15245-44-0, 1314-41-6, 7722-64-7
Cord, detonating - HMX 40gr Det cord	Explosive	CAS no 78-11-5
Detonators, electric for blasting - SQ-80 Igniter	Explosive	CAS no 78-11-5
Articles, explosives, nos – Booster	Explosive	CAS no 78-11-5, 121-8-24, 13424-46-9, 15245-44-0, 1314-41-6, 7722- 64-7
Igniters - Baker Secondary	Explosive	CAS no 10294-40-3, 7439-95-4
Cartridge, power device - #20 Baker power charge slow burn	Explosive	CAS no 7439-89-6, 7440-50-8, 7440-66-6, 9004-70-0, 55-63-0, 84-74-2, 15245-44-0
Charges, shaped - 2-00" Tubing Punch Charge	Explosive	CAS no 00121-82-4, 026914-41-0, 20062-22-0, 38082-89-2, 07429-90-5, 07439-89-6, 07782-42-5, 07440-50-8, 07439-92-1, 07440-33-7, 07440-66-6
OKS 611	F+	Naphtha (petroleum) heavy alkylate 25-50%. Propane liquefied 10-25%. Isobutene 10-25%. Butane, pure 2.5-5% 2-butoxyethanol ≤ 2.5%
Cesium 137	Radioactive	Cesium Chloride
Americium 241 Beryllium	Radioactive	Americium oxide with Beryllium metal
Tuned Light XLE	Irritant	Portland cement 60-100%, Crystalline silica, quartz 1-5%
Calcium Chloride Liquid	Irritant	Calcium Chloride 30-60%
Lafarge G	Irritant	Portland cement 60-100%, Crystalline silica, quartz < 3%
Gasstop-L	Irritant	Sodium hydroxide 1-5%
Microcem 650SR	Irritant	Portland Cement Clinker 5-100%
Rig Fuel Tank	Harmful En	Petroleum Hydrocarbons >99%
Bunded Fuel Tank	Harmful En	Petroleum Hydrocarbons >99%
Engine Oil 15W40	Tox Aq	Zinc alkyl dithiophosphate 1-2.4% Interchangeable low viscosity base
15% Hydrochloric Acid	Irritant	HCL 15% Water 85%
Nitrogen	Asphyxiant	CAS no 7727-37-9

The above is only of those chemical listed as Hazardous for the comprehensive listing please see the Full Permit Application. *(Foster, 2014)*

Appendix 33 – *Letter of Objection*

Fw: Ref. Land West of High Fosham. Drilling Well. 12/04193/STPLF
Shirley Ross to: Beverley DC 09/01/2013 11:47

From: Shirley Ross/CS/ERC
To: Beverley DC/CS/ERC@EAST_RIDING,

neighbour response

----- Forwarded by Shirley Ross/CS/ERC on 09/01/2013 11:46 -----

From: [redacted]
To: <shirley.ross@eastriding.gov.uk>,
Date: 09/01/2013 11:44
Subject: Ref. Land West of High Fosham. Drilling Well.

Dear Shirley Ross,

As my property is the closest to the proposed drilling well and having now read the recommended reasons for approval yet never having received any planning notification from East Riding Planning Dept.
I feel it is important that I instruct a qualified town and country planning agent to look at the close relation between the well site to my property and also the noise and the road access issues regarding this application.
I must explain that I have not intentionally taken a long time to comment but it was not made clear on the East Riding web site as to when the planning committee would meet as no were on the web site does it explain there are three types of planning meeting i.e. a west an east and a strategic meeting and because I did not receive any planning intention notice through the post from East Riding Council it was only a day before the actual meeting that I was informed via the Hull Daily Mail as to when the case would be discussed by the council.
Going back to the application I consider the response from the council does not take into account the very close proximitary the well will be to my property, this development even though it is said to be temporary will have a very adverse and disruptive effect on my property this is because it effectively adds an industrial environment to what is a very small rural setting.
My property is not only within 625m of the proposed well site it is the only property which is NOT OWNED BY THE LAND OWNER who is going to lease the land for the well site.
In the recommendation given by the council there is acknowledgement as to the very high levels of both noise and general traffic disturbance this development will cause for a long time to come.
The road down which at least 10 very large industrial heavy goods vehicles will have to travel every day is only nine feet wide and when a lorry which measures at least nine feet wide travels down this road no one else is going to able to use the road at the same time this will cause a great deal of obvious disruption down High Fosham road.

It is my contention that the company should meet with my self and should look at some package to mitigate both the noise issues and the disruption this development will cause me before it is approved by the council.

When this development site is compared with a well drilling site at Walkington there is no comparison, there are No HOUSES anywhere within a mile and the road along which traffic to the site has to travel at Walkington is a wide B road were as the High Fosham road is a very narrow country lane .
This proposed development is a large scale mineral extraction site and more care should be taken to ensure it will not harm human health as is stated in Paragraph 20 to the NPPF guidance as the noise that will have to be tolerated by the immediate properties for 24 hours a day could be very harmful.
The Landscape and Visual Amenity of such a rural Holderness area is not going to be maintained or enhanced by allowing this large scale industrialised drilling site.
Should oil be found by this development a permanent drill head or possibly two drill heads will be on site and used 24 hours a day therefore it will not be a temporary structure(even though a further

planning application will have to made ..once the site is there no way will it then be refused) A further intrusion into my visual amenity will be the use of a great many powerful lights which will be required throughout the night for both working and safety reasons.
I take great issue with the statement which says this development is acceptable because the site is relatively isolated, this development will effect my property but it would appear by the comments of the council because I am the only one who will be effected by what ever happens in this isolated Holderness area it will be acceptable.

Best regards
[redacted]

Appendix 34 – *Letter of Objection*

12/04/93/ STLCP

Treasure Cottage
Marton
Skirlaugh
Hull
HU11 5DA
5 Jan 2013.

P & ER
DEVELOPMENT CONTROL
REC'D -7 JAN 2013

For the attention of
Shirley Rasa.

Dear Madam,

I understand that a meeting was held on January 3rd to concentrate opinion regarding the application by Rathlin Energy (UK) Ltd, for full planning permission to bore for mineral exploration (petroleum) on Fosham Lane.

I was not given notification of this meeting and was therefore unable to attend.

I do have considerable objection to this application.

My property will be severely affected by the number of lorries passing close to my home, which stands 22 ft. from the Marton - Sproatley road.

In the 25 yrs I have lived in this property, the volume of traffic has increased threefold at least. This is a rural road and was never set up to take this amount of traffic (least of all in winter).

2

to hear the conclusions made.

Even now traffic has difficulty passing each other, and too often there is a queue outside my house, the result of which is clouds of fumes entering my house. This is particularly bad during Summer months when I open the windows for fresh air. The road is just not wide enough for two large vehicles to pass with ease.

There is also the question of the little bridge near my house. The road to the east of the bridge has been repaired a number of times, and without the extra weight, is already in need of further repair, as it is giving way into the dyke on the left hand side of the road. It cannot possibly take more weight of traffic, without giving way completely.

I hope my objections will be considered

Yours faithfully

Signature [redacted]

P & ER
CONTROL
2013

Appendix 35 – *Letter of Objection*

Planning and Development Management
AG19, County Hall, Beverley
E: beverley.dc@eastriding.gov.uk
W: www.eastriding.gov.uk

----- Forwarded by Carly Jensen/CR/ERC on 07/01/2013 08:55 -----

From: "[redacted]>

To: <beverley.dc@eastriding.gov.uk>

Date: 05/01/2013 15:52

Subject: Ref. No: 12/04193/STPLF

Construction of a temporary drilling site with associated access, to drill a borehole for the purposes of mineral exploration (petroleum)

Land West Of High Fosham Cottage Fosham Road High Fosham East Riding Of Yorkshire HU11 5DF

Ref. No: 12/04193/STPLF | Received: Wed 03 Oct 2012 | Validated: Tue 09 Oct 2012 | Status: Pending Decision

Sirs

It has come to my attention that the estimated number of heavy goods vehicles likely to be used in connection with this application has been increased from an initial 60 per day to 300 per day.

It takes little effort to realise the extra noise, pollution, wear and tear, driving hazard and congestion on narrow or/and, winding roads that will follow.

As this point has not been widely publicised I wish to object to the application. I would welcome an environmental impact assessment report carried out by an independent party.

Also. I am surprised the application was raised at the last planning meeting; I thought this was to happen later in the new year.

Yours faithfully

[redacted]

Appendix 36 – *Letter of Objection*

[redacted]

26/11/2012

East riding ref: DC/12/04193/STPLF/STRAT/SR1

Dear Mrs Ross,

I am writing to you about the proposed full planning permission for drilling by Rathlin energy down Fosham lane east riding of Yorkshire HU11 5DF.

The company set up a public exhibition last Friday at Aldborough village hall Friday the 23rd of November for people to come and view what they were planning on doing. We farm all the land at both sides of the proposed lane all the way down to the site around 200 acres.

We were shocked at the extent of the site and how much traffic there is going to be this is not a suitable place down a little road, they told us that they would have a controlled traffic flow down the lane with us farming the 200 acre down either side this is unacceptable it is the only access we have to the land.

As you may know farming has to work with the weather it is not possible for us to use a controlled traffic flow its ridiculous.

Fosham lane is also used by many people parking down the lane and walking down the two public footpaths across to Withernwick it's very popular with the walkers many days the lane can have six cars parked at one time.

I must also draw your attention to Marton village where we are based a narrow winding road hundreds of heavy lorries leading hardcore ect is not at all suitable plus the huge increase in workers cars twenty four hours a day drilling. We strongly object to this site .

The one more worrying thing is that many of the local surrounding villagers don't seem to know anything about the proposed drilling site and what effect it will have on them mainly the increase in traffic.

Yours faithfully

[redacted]

E.&.R. DEVELOPMENT CONTROL RECD 27 NOV 2012