South Western Energy Limited

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Puddletown Pilot Production Well

Scheme Overview for Puddletown Parish Council

November 2019

South Western Energy Limited

South Western Energy Limited (SWEL) has a 100% interest in 161.60 sq. km. of Petroleum Exploration and Development Licence 327 (PEDL327) which is part of a licence holding of 352.2 sq. km. in Dorset. SWEL holds a further 471.7 sq. km. of licences in North Somerset creating a total licence holding of 823.9 sq. km.

SWEL was granted PEDL327 by the Oil and Gas Authority (OGA) under the 14th Onshore Licensing Round. This licence gives the Applicant exclusive rights to search for subsurface petroleum by physical means within the licence area.

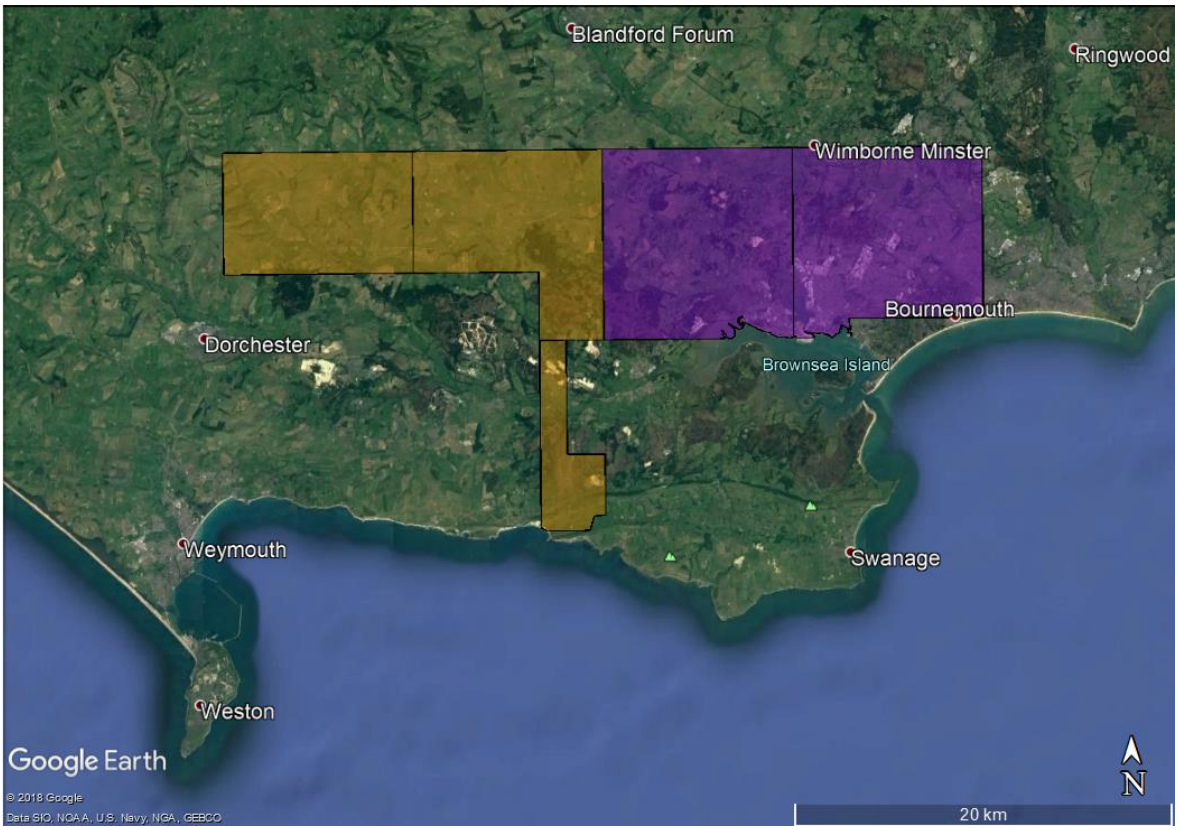


Figure 1: Location of SWEL Licence Areas in Dorset

Project Overview

The proposed Puddletown Pilot Production Well is located near Puddletown, Dorset.

This project comprises a single vertical conventional oil well.

This application for the Puddletown well does not entail fracking.

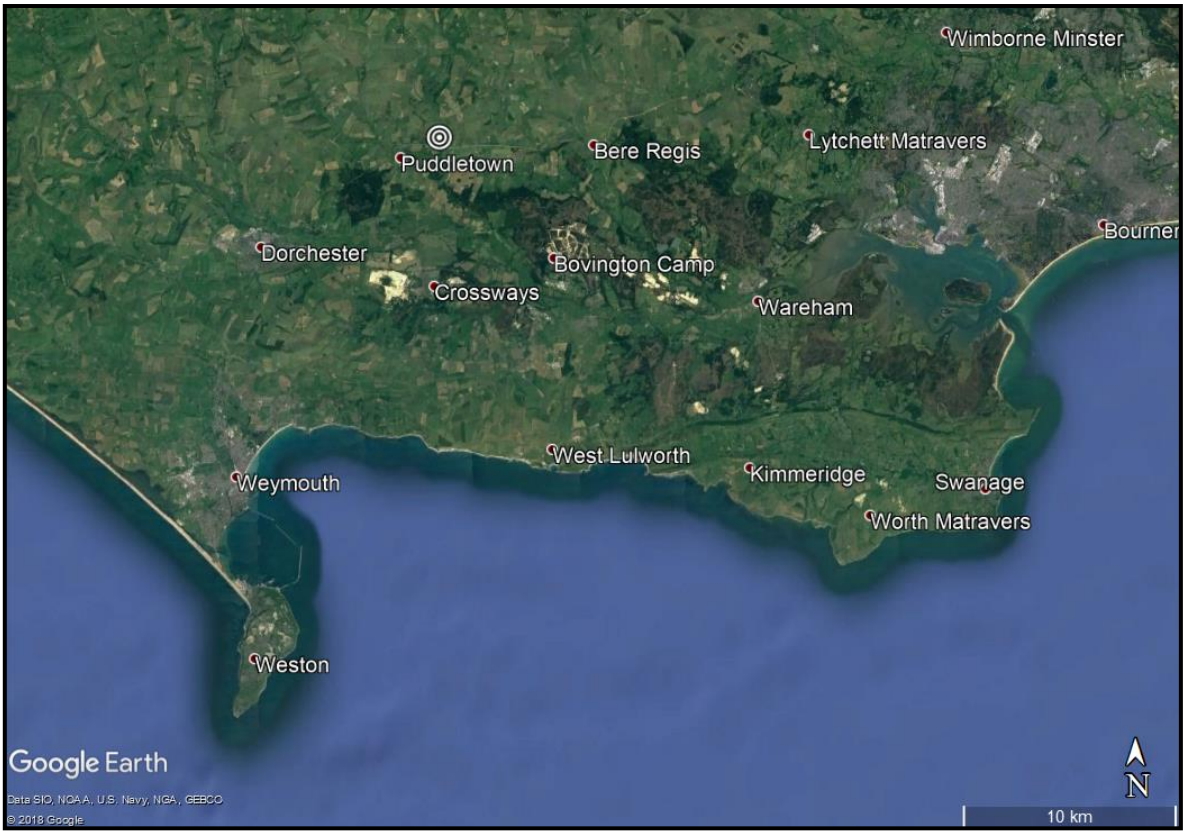
Following production of oil it is proposed that oil will be transported by road to the nearby Fawley oil refinery which is the largest oil refinery in the United Kingdom, and one of the most complex refineries in Europe.

The Puddletown Pilot Production Site

Well Site and Access

The drill site is located on private land near Puddletown, Dorset. The National Grid Coordinates for the site are: -

Easting 377382 **Northing 095370**

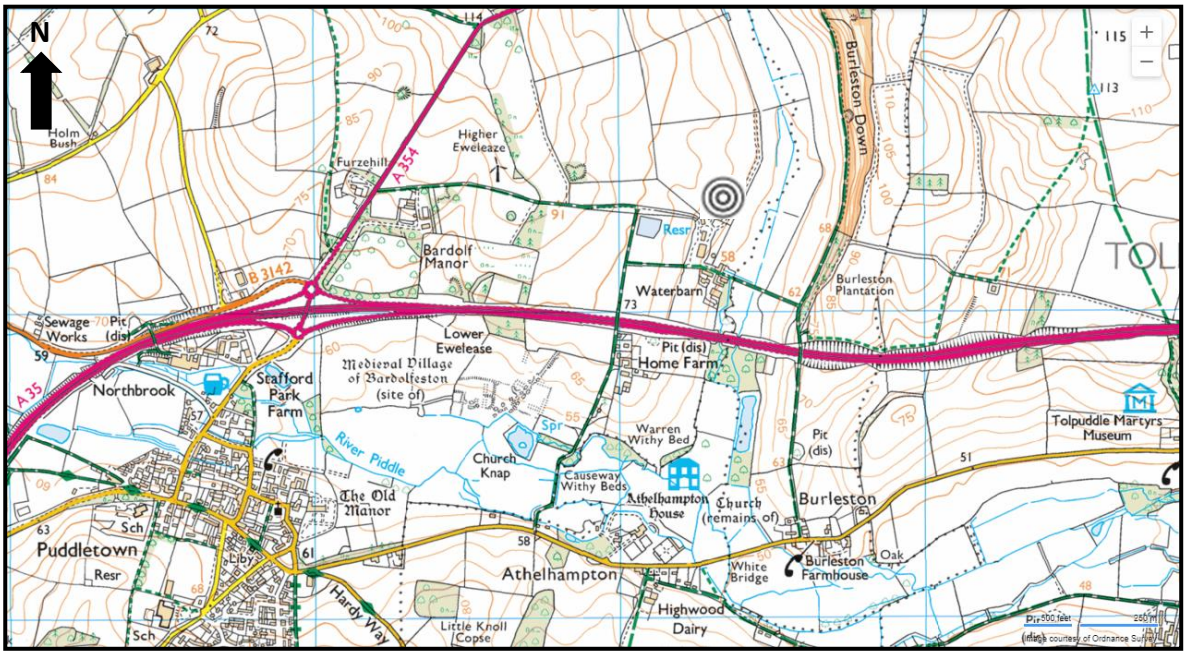


Site Location

Figure 2: The location of the proposed Puddletown Pilot Production Well on a local scale

Site Location

Figure 3: The location of the proposed Puddletown Pilot Production Well



Site Location

Figure 4: OS Map of the Location of the proposed Puddletown Pilot Production Well

The site does not lie within any designated environmental areas. The nearest environmental designation is the Dorset AONB which lies 1.25km to the north of the proposed development. The nearest nature designation is the Site of County/Local Importance for Nature Conservation (SLINC) at Burleston Down which lies 0.33km to the east. The nearest heritage designation is the Deserted Village of Bardolfeston which is a Scheduled Ancient Monument and lies 0.65km to the south-west.

Road access to the site is good and access within the boundaries of the private land holding itself is via existing tracks of sufficient width. Some small scale improvements may be made to the farm tracks, especially where pot holes are present for example. A public bridleway runs along the track used to access the proposed well site (Athelhampton Road), however, the public bridleway diverts away from the well site itself. The public bridleway can remain open to the public during the site works and SWEL will implement certain rules, such as speed limits, which all site vehicles will adhere to. The landowner has installed an electronic gate on the initial section of the access track/bridleway; this will ensure that only authorised vehicles are able to access the site.

The nearest natural water body is a sluice (Devil's Brook) that runs some 0.15 km to the east of the site. The River Piddle is the nearest main water body and flows approximately 1 km to the south.

The Environment Agency does not class the site as being in a flood plain; the scheme is in an area that has a low probability of flooding (Flood Zone 1). There is, however, risk of flooding along and adjacent to the nearby sluice.

The Project Development

The development will be split into phases: -

1. The Site Establishment Phase

The site is prepared for the arrival of the drilling rig.

2. The Drilling Phase

The well site will comprise of a drilling area which is made up of the drill rig and ancillaries, tool rack, tanks and generator. Up to five container type units will be held on site to be used as site office and storage facilities. The eastern perimeter of the well site will contain an excavated trench/bund and a land drain installed to collect surface water in a submerged, sealed interceptor tank located across the lowest point. All excavated material will be retained for restoration purposes. At no time will any fluids be allowed to drain from the site.

3. The Testing Phase

The purpose of the testing phase is to identify the production potential of the reservoir. Following the geophysical testing and results from drilling, the well is proposed to be completed with the installation of an electrical submersible pump (ESP) which will be placed at the bottom of the well. Alternatively, a truck mounted swabbing unit may be utilised. If the flow rates from the well demand it, then a beam pump may be fitted.

4. The Production Phase

If the drilling and testing prove successful, the site should produce hydrocarbons. Produced oil would be stored in above ground tanks prior to collection; it is proposed that the oil be transported from the site in up to 8 tankers per day to Fawley refinery.

The development area of the site is approximately 0.4 hectares therefore the impact of the surface development would be minimal.

5. The Restoration Phase

Once production has ceased the site would be restored to its original or a better condition.

Timings

The site establishment would take place over a two-week period working from 08:00 until 18:00 daily (i.e. the Site Establishment Phase).

The drilling would take place 24 hours per day 7 days per week (including Bank Holidays) and the duration of the drilling would be 6-8 weeks for the vertical pilot production well (i.e. the Drilling Phase).

Testing would take place over a two-week period 24 hours per day 7 days per week (including Bank Holidays) (i.e. the Testing Phase).

Production would take place 24 hours per day with up to 8 tanker movements per day based on the volume of production from the well.

Purpose of the Development

The production of oil in the UK has been steadily declining and our Nation is becoming more and more reliant on imports; the Security of National Energy Supply in the current global economic climate is vital. Oil forms a key part of the UK's energy mix as illustrated in the figure below.

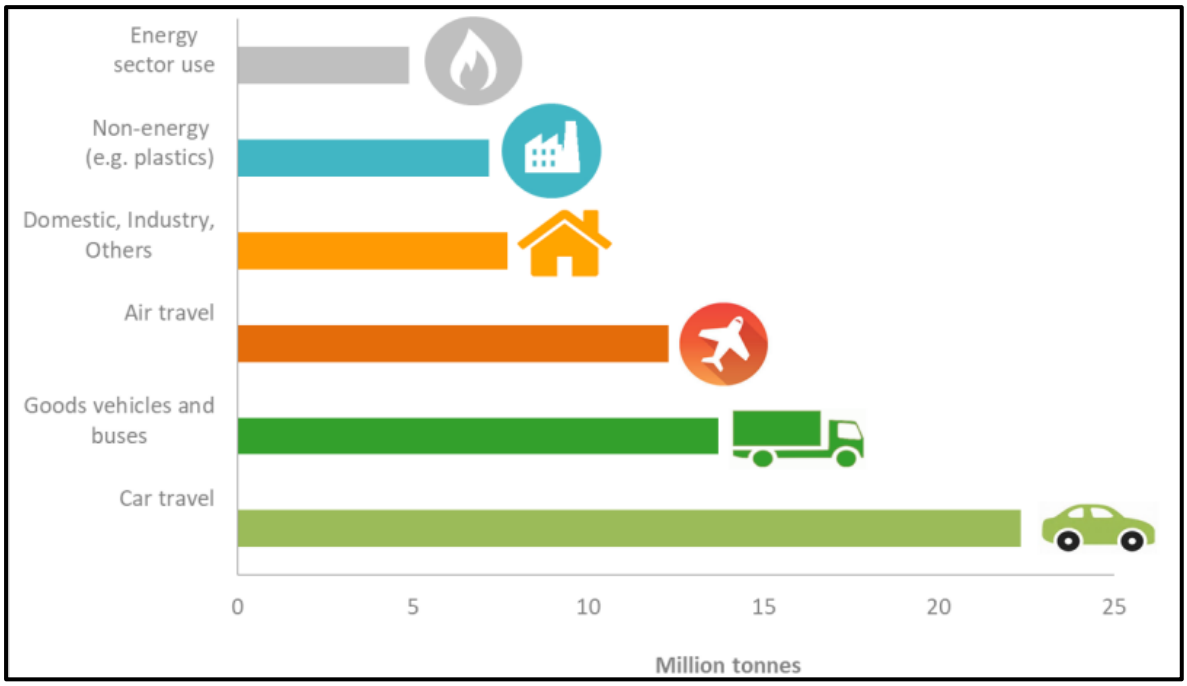


Figure 5: Oil consumption in the UK in 2018

Over 40 percent of the UK's total energy production in 2018 was from crude oils extracted from the UK's Continental Shelf, UK refineries produced 58 million tonnes of oil products. SWELs proposed development will help reduce the current critical importance of imports to meet UK domestic demand; the UK has been a net importer of oil since 2013.

Although the consumption of oil in the UK has been reducing over the past ten years and is likely to continue, there is still a large demand for oil. Most oil consumption in the UK (>70%) is used for transportation, especially road transport.

Figure 6: Trends in oil consumption in the UK in 2018

Oil is critical to transport requirements and will likely remain so in the near term as cars may be adapted to electrification and alternative fuels but aircraft, shipping, military vehicles and large goods vehicles are currently, due to their engine capacities, less adaptable to conversion.

Outside of transport, 'non-energy' use of oil is the single most significant sector. Here oil is not burnt but instead used as a feedstock to produce plastics and vinyls within the petrochemical industry. Non-energy use of oil has now stabilised at around 10 per cent of total demand for oil.

The area of interest follows the general geological trends of the Weald Basin where there has been a long history of oil and gas exploration and production, the initial exploration wells being drilled in the 1930's with the first production sites drilled 60 years ago. The area around Kimmeridge is situated in one of Europe's most prolific onshore oil provinces; the Kimmeridge Field (21km south east of the proposed site) is still in production since its discovery in the 1960's.

Wytch Farm is the biggest onshore oilfield in Europe. It is a mature oil field that has been extracting oil and associated gas from sandstone and limestone oil reservoirs in the Wessex Basin since 1979. The Wytch Farm oil field comprises three separate oil reservoirs; the Bridport and Sherwood Jurassic sandstone oil reservoirs and the Frome clay/limestone oil reservoir. The Bridport Sands, lying 900m beneath the surface, was discovered in 1973. The Sherwood Sandstone reservoir, situated at a depth of 1,600m, was discovered in 1978. The

Frome Clay reservoir, containing 7.5 million barrels of oil at a depth of 750m, was discovered later. Oil production from Wytch Farm peaked at 110,000 barrels per day in 1997 compared to 6,000 barrels per day in 1984, however, production has gradually declined since then to 50,000 barrels per day in 2002 and to 13,000 barrels per day in 2019. More than 100 wells (including producers and water injectors) were being operated from 13 well sites at the Wytch Farm oilfield as of June 2012.

SWELs proposed site was selected following the review of historical records. The proposed site is in an area of known hydrocarbon accumulations with the Waddock Cross oil field lying approximately 5km to the south-east.

Atomic Dielectric Resonance (ADR) testing has been undertaken on the SWEL site, the results of which indicate the presence of hydrocarbons at the site.

From the results of geological modelling and ADR testing, SWEL are designing and propose to drill a pilot production well to prove conventional oil production. A planning application is being submitted to Dorset Council to facilitate the drilling of the well and production of oil from that well together with road transport via tankers to the nearby Fawley Refinery.

The successful production of hydrocarbons from this scheme will reduce the overall import of hydrocarbons into the UK, help protect the Security of National Energy Supply and create local employment.

Environmental Effects

No complex or hazardous environmental effects are expected to be generated at the site, there will also be no cultural, historic or archaeological effects. As previously stated, the proposed development site does not lie within any designated environmental areas, the nearest is 1.25km to the north.

Noise will be generated by the drilling rig, its ancillary equipment and associated vehicle movements. An independent third party Noise Impact Assessment has been carried out and is being submitted with the planning application. Noise absorbing fence panels together with any practicable good practice given by the independent noise consultants will be implemented. The full Noise Impact Assessment is being submitted with the planning application.

The development site has previously been cultivated for maize together with other arable products. The proposed development is not expected to have any detrimental effects to local species and habitats. An independent third party ecology survey has been carried out and is being submitted with the planning application. Any practicable mitigation suggestions contained in the assessment will be implemented.

Rainwater falling on the site will be managed by way of a perimeter trench and interceptor tank, installed to collect the surface water so that, during the drilling period, it will be removed from site using a licensed carrier and transported to a licensed waste facility for appropriate disposal and treatment. This measure will be put in place to prevent any contamination of the surrounding soils or watercourses occurring.

The local water bearing strata will be sealed off using steel casing installed in the well. When water is used as the drilling fluid it requires an additive as water is not viscous enough to lift the cuttings (pieces of rock created by drilling) to the surface. In the unlikely event of drilling

fluid entering groundwater, it will have no ill effect as the drilling fluid additive SWEL would use i.e. Pure-Bore, has been approved for use in public water supplies under regulation 31(4)a of the Water Supply (Water Quality) Regulations 2000 and the Water Supply (Water Quality) Regulations 2010. Pure-Bore is also included in the "List of Approved Products for use in Public Water Supply in the United Kingdom". Pure-Bore is used to drill water wells.

The development and continued operation of the site will require vehicle movements to and from the site. During the site construction and set up phase, delivery vehicles will bring the necessary equipment to the site, an excavator will also travel to site to install the drilling cellar and perimeter rainwater control trench. The drilling rig will travel to site during periods of low traffic volumes to minimise disruption to fellow road users. Traffic movements during the drilling phase will comprise of licensed carriers removing waste materials from the site as well as site staff arriving and leaving at the beginning and end of each shift. Deliveries will continue to be made during the drilling phase. During the testing phase, the vehicle movements will reduce dramatically with site staff attending the site periodically to check the equipment, take measurements etc. If the well produces oil, it will be on a relatively small scale and traffic movements during the production stage will mainly consist of tankers transporting the oil to the nearby refinery.

The site access tracks can be dampened if required to mitigate dust, however, this measure is not currently carried out by any farm vehicles using the track. A wheel washing facility is already in existence adjacent to the proposed site, this can be utilised if deemed necessary.

The well site is located on private farmland and cannot be accessed by the public without authorisation. The site will not have any impact on public traffic flow. A traffic survey has been undertaken which is being included with the planning application.

The vehicle movements will have a negligible effect on air quality. Air quality will be continually measured at the surface during the drilling period.

Diesel fuel is the main product that has the potential to spill and run on the site during drilling, albeit this would be a result of human error. The storage of all fuels will be within above ground bunded fuel tanks. During fuel transfer, absorbent matting will be placed below the fuel fill point to capture any spillage. Drip trays lined with absorbent matting will also be placed under the drilling rig at all times. Spill control kits will be held on site to deal with any spillage should it occur. The perimeter trench will collect any surface water to prevent any spillage coming into contact with surrounding soils.

To summarise, the development is not expected to cause any negative environmental effects. The site will be restored to its previous or a better condition should the well prove unproductive or once it reaches the end of its producing life; the development has a high degree of reversibility and will leave no trace of its former presence.

Conclusion

South Western Energy Limited is submitting a planning application and environmental permit application for a pilot production development well on privately owned land at Easting 377382, Northing 095370. The well will not include fracking. The purpose of the well is to test production in the Cornbrash, Bridport Sands and Sherwood Sandstone. It is proposed that oil produced will be transported by road to the nearby Fawley Refinery.