

Dave Kubeczko - DNR

From: Dave Kubeczko - DNR
Sent: Monday, May 09, 2016 9:13 AM
To: Dave Kubeczko
Subject: Anderson C2 and C3 Info

Categories: Operator Correspondence

Scan No. 2107811

ENGINEERING AND SITING INFORMATION

2A#400950178

From: Sandoz, Christopher [mailto:Christopher.Sandoz@bp.com]
Sent: Thursday, April 07, 2016 3:33 PM
To: Weems - DNR, Mark
Cc: dave.kubeczko@state.co.us; Azulai, Naomi
Subject: RE: Anderson C2 and C3 Info

Sorry – I neglected to include the map showing the locations that we considered (see attached).

From: Sandoz, Christopher
Sent: Thursday, April 07, 2016 11:50 AM
To: 'Weems - DNR, Mark'
Cc: dave.kubeczko@state.co.us; Azulai, Naomi
Subject: RE: Anderson C2 and C3 Info

Mr. Weems,

I apologize for taking so long to get back to you with the additional information that you requested.

As you know, the location of the reserves, the depth of the surface casing, the depth of the target formation, the spacing unit requirements, and the surface location availability are all factors which result in the need for a particular well design. Surface location availability is restricted by mineral ownership, setbacks to structures, property boundaries and utility lines, topography, and the need to accommodate continued land use. Another factor is the limit on the number of separate surface locations which can be constructed in each section imposed by the various COGCC infill orders and the La Plata County Planning Code without an exception.

The feasibility of a particular well design is determined by the cost to drill it, the commodity price and whether the well delivered will be able to recover the reserves to make the whole process economic. Certain well designs, which may technically be drillable, are not deemed feasible due to the potential long-term costs associated with the operation of wells and the risks that the planned reserves will not be recovered.

Our experience indicates Fruitland coal wells which are deviated beyond 40 degrees typically have higher operating costs due to increased rod pump equipment failure frequency and increased maintenance requirements. These design limits are supported by the attached graph which summarizes an analysis of 398 BP operated wells. This analysis shows failures occur, on average, once every 3.8 years for wells where maximum deviation is limited to 20 degrees or less. The failure rate continues to increase as maximum deviation is increased, with a failure occurring, on average, every 3.2 years for wells with a maximum deviation between 40.1 and 45 degrees. It should also be noted there are very few wells with maximum deviations of more than 55 degrees in the data set. These highly deviated wells were excluded from the analysis because these designs typically involve horizontal laterals with a pump placed in the vertical section or in a pilot hole, and they exhibit failure rates similar to those of less deviated wells.

In the case of the Anderson C2 and C3 wells, the chosen location represents the only location for which BP could obtain a surface use agreement with the landowner suitable for drilling two additional wells and which would also satisfy the above referenced criteria for a well design capable of economically recovering these mineral resources.

BP made a good faith effort to comply with the set-back requirements for the subject location by considering six different alternative surface locations for these wells. These alternative surface locations were deemed infeasible due to various conflicts including those with the surface owner's agricultural operations. BP even attempted to pursue the use of an off-lease, off-unit location, however we were unable to reach an agreement with the surface owner which is required when we have no lease rights to a location. The attached table summarizes the various surface locations we considered and the obstacles preventing their use.

In addition to the locations we considered internally, recent email correspondence from Mr. Dave Kubeczko with your office requested additional information on why the existing Witt GU 34-23 No. 1 location or the previously permitted surface location for the Anderson C2 and C3 were not considered for these new wells. The existing Witt Pad (Loc Id #326360) and the previously permitted Anderson C2/C3 Location (Loc Id #428309) are not suitable locations for the subject wells due to the design thresholds discussed above. In addition, the Witt Pad is located on a separate lease which is off-unit and therefore BP has no legal authority to use this location for the subject wells.

We appreciate your consideration of our variance request. If you have any additional questions, please let me know.

Thank you,

Chris

Chris Sandoz
Regulatory Engineer
BP America Production Co – Lower 48 Onshore
713-323-3520 (office)
225-235-5230 (mobile)

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From: Weems - DNR, Mark [<mailto:mark.weems@state.co.us>]

Sent: Tuesday, March 08, 2016 4:59 PM

To: Sandoz, Christopher

Subject: Fwd: Anderson C2 and C3 Info

Did you get a copy of this? ... I can't believe I didn't think of you...

Mark Weems, P. E.
Regional Engineer - SW Colorado



P [970.259.4587](tel:970.259.4587) | F [970.259.0743](tel:970.259.0743) | C [970.749.0624](tel:970.749.0624)

1120 Lincoln Street, Suite 801, Denver, CO 80203

----- Forwarded message -----

From: **Weems - DNR, Mark** <mark.weems@state.co.us>

Date: Wed, Mar 2, 2016 at 5:51 PM

Subject: Re: Anderson C2 and C3 Info

To: "Azulai, Naomi" <Naomi.Azulai@bp.com>

Cc: Dave Kubeczko - DNR <dave.kubeczko@state.co.us>, Dave Andrews <david.andrews@state.co.us>

Hi, Naomi,

My first pass on processing and getting BP's set back variance approved from a drilling perspective (COGCC engineering) for these two pending permits didn't make the in house cut. More information is required than what you provided in your variance request letter and your recent email response back to Dave Kubeczko (see below).

Letter Requesting Variance

Location of the pad is also dependent on the ability to reach the bottom hole locations for each of the wells accommodated on this pad.

Email Response

From Nate Churchwell, "The step-out constraint for the Anderson C2 is driven by our desire to maximize well performance with minimal long term intervention. What we accomplish with a shorter stepout is a reduction in maximum wellbore inclination to reach our desired reservoir target. Our experience has shown us that the result of a smaller inclination is fewer well interventions and more efficient operations. The maximum step-out is what we feel is our technical limit when it comes to creating a wellbore that will be most efficiently produced and we propose our surface locations under this constraint.

What are the specific technical reasons these wells cannot be drilled in other locations to meet the surface setback rules? The information in your variance request is insufficient for just cause to authorize and approve the request. I would prefer speaking with BP's drilling engineer and if BP deems it necessary, anyone else pertinent to sharing information and making final decisions & approvals.

My experience has been that these wells can be drilled from various other locations, but could be more difficult, risky and costly. Also, the sharper the twist and turns are in the wellbore along with a greater angled wellbore (approaching horizontal) usually creates more wear and tear on rods, pumps, and tubing which increases monthly operating costs. In this case, these wells will be started vertically then a build and hold (constant angle) to TD. If these are indeed the reasons for not drilling in other various locations, then the engineers must so state and provide specific reasons and justifications and proof. I would prefer written explanations to follow my verbal conversation. BTW, this may and even likely require specific in house and performance data from your records.

Remember to focus all and any responses along drilling and production technical reasons and explanations.

Thanks,

Mark Weems, P. E.
Regional Engineer - SW Colorado



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mark.weems@state.co.us | www.colorado.gov/cogcc

On Tue, Mar 1, 2016 at 9:04 AM, Azulai, Naomi <Naomi.Azulai@bp.com> wrote:

Mark,

It was a pleasure speaking to you just now. We'll catch up with the Andersons later today.

The document numbers for the APDs are as follows:

Anderson C2 Doc #400950248

Anderson C3 Doc #400950253

These two wells will be sharing a pad.

Naomi Azulai

Well Permitting Analyst

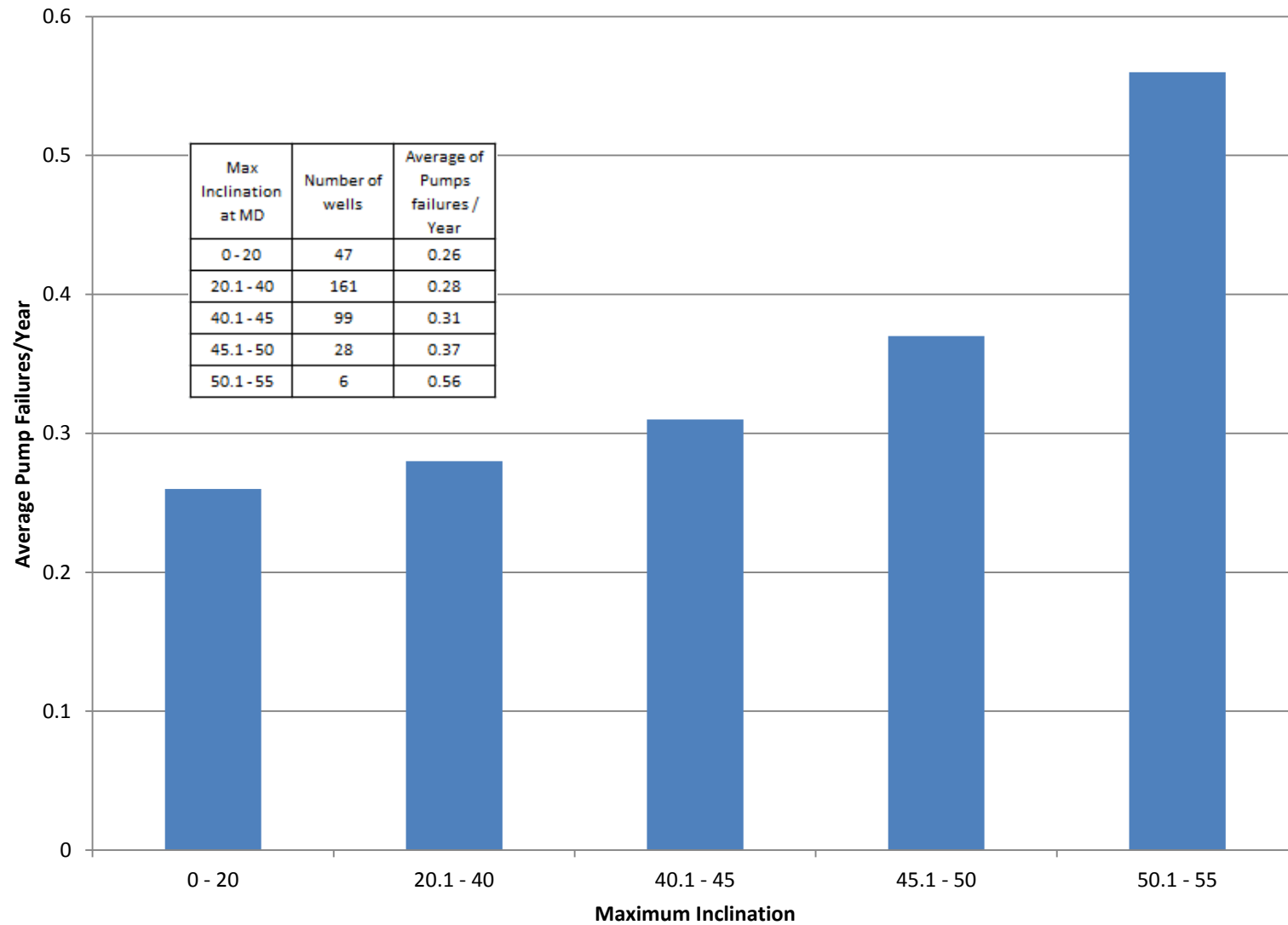
BP L48

Tel: [970.375.7511](tel:970.375.7511)

Naomi.Azulai@bp.com

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Max. Inclination v. Average of Pump Failures/Year



Summary of Location Assessment Activity for Anderson C2 and C3 Well Pad

Option	Rationale
Anderson C1 Pad Expansion	This location is suitable for the C3, but not the C2. The use of this location for the C2 would require a well design which exceeds the desired deviation/dog leg severity parameters for the Anderson C2 well.
A	This location is off-lease/unit in the north half of the section. We were unable to negotiate a surface agreement with the surface owner.
B	This location between two center pivots was not acceptable to the surface owner due to impacts on current and intended uses (irrigated crops, buried irrigation canal, construction plans).
C	This location to the north of the landowner's house was not acceptable to the surface owner due to impacts on current and intended uses (irrigated crops, buried septic system).
D	This location was not acceptable to the surface owner due to impacts on current and intended uses (irrigated crops).
Proposed	This location was recommended by surface owner and satisfied all well design requirements for both the Anderson C2 and Anderson C3 wells.

Note: LaPlata County regulations and COGCC Order 112-180 limit the number of pads per section to 4. There are already 4 existing pads in Section 23 to the west and Section 25 to the south.



- Hydro
- La Plata Co Parcels
- Structure Footprints
- 150 ft Property Line Set-back
- 200 ft Powerline Set-back
- 500 ft Occupied Structure Set-back

LAND TYPE: FEE
 LAT: 37.173429 N
 LONG: -107.67237 W
 NE 1/4 SW 1/4 SEC 24, T34N R 08W

1:10,000

0 750 1,500 Feet

DISCLAIMER: This general arrangement drawing (GAD) has been generated for a preliminary discussion of a proposed access road, pipeline, drillsite or other type of facility. The location and arrangement thereof are approximate and subject to change at any time, whether due to on-the-ground surveys, regulatory requirements or (without limitation) other factors. Reclamation plans do not reflect cut and fill slopes and are subject to change as data is acquired. This GAD is confidential and its duplication or distribution requires written permission from BP America Production Company.

ANDERSON C 2 & 3
 SPACING UNIT

2/17/2016 SCALE AS NOTED PROJ #
 DB - ENGINEER FILE

BP America
 San Juan North
 Durango, CO

La Plata County, Colorado

REV 0