Response to Comments
Wyoming NTL 2003-1

General

Comment 1

Numerous comments expressed a concern that BLM is not adopting API Chapter 21.1 in whole. Instead, the NTL proposes to adopt API 21.1 with several amendments and additions. Their reasoning is that the API standard represents a collective work of the gas industry, based on arduous discussion and supported technical information, and BLM should accept it as is. In addition, the comments continue, the NTL will create two standards; one applying to electronic flow computers under BLM jurisdiction in Wyoming (the NTL), and another (API 21.1 in whole), applying to all other electronic flow computers.

BLM recognizes that API 21.1 is an excellent and comprehensive standard for electronic flow computers. That is why we have incorporated the standard by reference in the NTL. Prior to the issuance of the NTL, BLM has never adopted or enforced any of the provisions of API 21.1. Unfortunately, API 21.1 contains several statements that: 1) exceed existing requirements for chart recorders under Onshore Oil and Gas Order 5; 2) conflict with existing laws, or; 3) do not adequately define violations for the purposes of enforcement. Therefore, nine specific additional requirements to API 21.1 have been included in this NTL. In addition, four of the provisions of API 21.1 will not be enforced by BLM. As a result, BLM will be able to enforce the remaining provisions. Each of the nine additional requirements, as well as the four provisions that will not be enforced, will be discussed under that particular requirement. For the most part, the additional requirements are minor and should not represent a significant burden to the industry. In general, we felt it was more beneficial to adopt the majority of API 21.1, with a few additional requirements, than to not adopt it all.

To clarify our intent, some wording changes were made in reference to API 21.1, which are discussed in Comment 12, below.

Comment 1A

One comment suggested that BLM use language that will automatically adopt the most current version of a standard, rather than having to rewrite an NTL every time a standard is updated. While this would help streamline the rulemaking process, there are also some disadvantages to this approach. As evidenced by this NTL, BLM does not necessarily adopt API or other standards in whole because of potential conflicts with existing laws, regulations, orders, or policy. We may also have technical issues with new standards. Therefore, we feel that anytime a standard is updated or developed, BLM should have the opportunity to carefully review the standard and make a case by case decision on whether or not to adopt it, or to adopt only parts of the standard. No changes were made as a result of this comment.

Comment 2

Some comments suggested that the NTL should include linear devices such as turbine and ultrasonic meters because they are also included in API 21.1.

The purpose of an NTL is to address large-scale issues, more efficiently handled on a regional basis than on a case by case basis. Onshore Oil and Gas Order 5 provides blanket approval for orifice meters with chart recorders. Any other form of gas measurement requires either a case-specific variance from a field office, or an NTL, which provides regional approval. With wide spread use of electronic flow computers as part of an orifice metering system, the issuance of case-specific variances was becoming a significant workload for both BLM and industry. Therefore, the NTL was written to reduce the burden of processing large numbers of electronic flow computer variances. The NTL was never intended to be a comprehensive gas measurement order addressing all forms of measurement devices. Relatively few variance requests have been received for the linear devices referenced by the commenters. Linear devices will still require case specific variances to be issued. No changes to the NTL were made as a result of this comment.

Comment 3

One comment expressed concern that different BLM offices will interpret the NTL differently, resulting in additional costs for companies operating in different geographic areas. This is an internal problem that is of concern for all regulations, and is not specific to this NTL. BLM is addressing this with a more thorough training program and improved coordination.

The commenter also asked if this NTL applied to all BLM offices in Wyoming and Nebraska, to which the answer is “yes”.

No changes were made as a result of this comment.

Comment 4

A request that previously approved variances be “grandfathered” was made by several commenters. One of the purposes of an NTL is to provide consistent requirements for all meters within the jurisdiction of the NTL. If existing variances were grandfathered, it would result in inconsistent requirements, not only between federal and non-federal meters, but also between field offices and areas within field offices. In other comments, industry has expressed a desire for consistent measurement standards, which we feel can only be accomplished by making this NTL retroactive to all electronic flow computers. No changes were made as a result of this comment.

Comment 5

Several comments pointed out that BLM did not take advantage of opportunities to participate in the development of API 21.1, thereby ensuring that BLM's concerns were addressed in the standard. A recommendation for BLM to fully participate in the development of future standards was also stressed by one commenter. This comment is duly noted, however, no changes to the NTL were made as a result.

Comment 5A

Two industry representatives offered to assist BLM in developing the final NTL and to help in developing an uncertainty model. Unfortunately, BLM cannot allow individual interests to assist in developing a final rule. The public comment process is designed to allow any interested party the opportunity to comment and participate. Having an individual interest involved outside of the public comment process would violate the Federal Advisory Committee Act, which has set detailed procedures to ensure any advisory committee is balanced and includes all interests. BLM does intend to solicit the help of a third party in developing an uncertainty model.

Second Paragraph

Comment 6

Three comments argued that a "pitot tube" is a velocity meter and not a differential type of flow meter as stated in the second paragraph of the NTL.

We do not agree. The definition of a differential-type flow meter in the NTL states "a meter that determines flow rate as a function of a change in gas pressure caused by the meter geometry". If a pitot tube is used for flow measurement, the flowrate is determined as a function of the difference between the stagnation (total) pressure and the static (or flowing) pressure. Therefore, a pitot tube meets the definition of a differential-type flow meter. This is, in fact, confirmed by other publications such as API Chapter 5.7, Figure 9, and "Flow Measurement Engineering Handbook, Third Edition", Richard W. Miller, 1996, page 6.1. No changes were made as a result of this comment.

Comment 7

Numerous comments expressed concern that the NTL was approving other primary devices besides orifice plates that may not have gone through the same level of testing as orifice plates. Some of the comments went on to ask for a specific list of the differential-types of flow meters that were affected by the NTL.

This NTL only approves electronic flow computers used in conjunction with differential types of flow meters. It does not address or approve any primary elements. Orifice plate meters are already approved under Onshore Oil and Gas Order 5. Any other type of primary element would require a case-specific variance that is beyond the scope of this

NTL.

BLM included “differential-type flow meters” instead of limiting the NTL specifically to “orifice meters” because all differential-type flow meters operate under the same basic principal and use virtually the same type of secondary and tertiary instrumentation. In addition, all differential-type flow meters are subject to square root error, which is robustly addressed by API 21.1. Therefore, it seemed prudent to extend the requirements of electronic flow computers to any similar type of primary device, when or if approved under separate variance or future NTL.

While no changes to the NTL were made based on this comment, BLM will take steps to identify which specific types of meters must meet the requirements of this NTL at the time a variance request is made. Adherence to this NTL, if appropriate, will be required as a Condition of Approval.

Comment 8

BLM received two comments objecting to the definition of an electronic flow computer as a “secondary device”. This is in conflict with API 21.1, which defines the secondary device as providing data (i.e. transducers and transmitters) and defines the tertiary device as the flow computer.

Because BLM is attempting to adopt as much of API 21.1 as possible, we agree with this comment, and have changed the last sentence of the second paragraph to read: “An ‘*electronic flow computer*’ includes the secondary device that electronically measures the differential pressure and other variables, and the tertiary device which makes flow rate calculations and stores the data taken.”

Comment 9

One comment suggested that if the NTL is going to provide definitions that are not consistent with various measurement standards (i.e. “differential-type flow meter” and “electronic flow computer”), that our definitions must be complete and unabbreviated. By adopting API language for “secondary” and “tertiary” devices, part of the commenter’s concern is alleviated. As for the definition of “differential-type flow meter”, API 21.1 does not offer a definition that could be used in the NTL. However, API Chapter 5.7.1.1, defines “differential pressure flow measurement devices” (which BLM interprets to be synonymous with “differential-type flow meter”), to be “any flow meter operating on the principal of a local change in flow velocity, caused by the meter geometry, giving a corresponding change of pressure between two set locations.” We feel this definition, from a published measurement standard, is reasonably consistent with the definition provided in the NTL. No further changes to the NTL were made based on this comment.

Requirement 1

Comment 10

One commenter asked if Onshore Order 5 still holds for natural gas measurement using chart recorders. The answer is "yes". In fact, Onshore Order 5 provides the intent and basis for all gas measurement systems that fall within BLM jurisdiction. No changes were made based on this comment.

Comment 11

BLM received one comment that suggested industry standards be followed for both chart recorders and electronic flow computers, in reference to requirements in Onshore Order 5 for differential and static pressure pens operating in the outer 2/3 of the chart (III.C.4 and III.C.5). BLM is not aware of any published industry standards for the acceptable operating range of either pens on a chart recorder or for transducers/transmitters in an electronic flow computer. No changes were made as a result of the comment.

Requirement 2

Comment 12

In addition to the numerous comments objecting to not adopting API 21.1 in whole (see Comment 1), one comment asked if the API standards still applied because the NTL is amending and superceding some parts of API 21.1. The question went on to ask if standards in the NTL were considered to be additional requirements or were in place of the API requirements.

In retrospect, the words "supercede" and "amend" may have been poor choices of words as BLM has no authority to unilaterally change a published industry standard. Nor was this our intent. Our intent was to adopt as much as API 21.1 as we could. In some areas, BLM feels that additional requirements are necessary to fulfill our legal mandate to ensure accurate measurement and proper reporting. Additionally, there are some parts of API 21.1 that BLM cannot enforce because they exceed or contradict existing laws or requirements.

In an attempt to alleviate the commenter's concerns, we have replaced the wording in the second sentence of Requirement 2 with: "In addition, Paragraphs 4, 5, 6, 8, 9, 10, 12, 13 and 16, specify additional requirements to API 21.1. Paragraphs 8, 10, 12, and 13, also state that only some of the provisions of API 21.1 will be enforced by BLM. Specific portions of API 21.1 are referenced at the end of each paragraph listed above."

Comment 13

One commenter asked if language in the NTL contradicted language in a company's contract, if the contract language would be negated. The answer is "no". BLM has no direct authority over an operator's sales contract. However, the operator will be expected to comply with the NTL regardless of the language in their sales contract. No changes to

the NTL were made as a result of this comment.

Requirement 3

Comment 14

Numerous comments objected to the inclusion of NX-19 and AGA Committee Report No. 3 as an acceptable method of calculating supercompressibility. Instead, the comments stated, AGA 8 should be used exclusively.

We agree that AGA 8 provides the best calculation of supercompressibility. However, one of our overall principals when developing this NTL was consistency with Onshore Oil and Gas Order 5 to the extent possible. Onshore Oil and Gas Order 5 specifically requires the use of AGA Committee Report No. 3, 1985. Within the 1985 version is Table D5, which can be used to calculate the supercompressibility factor. This is an allowable calculation for gas measurement using chart recorders. The table is an excerpt from NX-19. Therefore, to be consistent with the requirements for chart recorders, NX-19, as well as AGA Committee Report No. 3, 1985, will be allowed in this NTL for the calculation of supercompressibility.

However, in AGA Committee Report No. 3, Part 3, 1992, the supercompressibility table (Table 3-B-11) states that it is "for informational purposes only". As a result, we removed reference to AGA Committee Report No. 3, Part 3, 1992, as an acceptable method to calculate supercompressibility.

Requirement 4

Comment 15

A number of commenters said that the requirement for a display is costly and onerous, and does not improve measurement accuracy. Some of these commenters also stated that access to the data can be obtained by notifying the operator or through a laptop or portable data collection unit.

We agree that a display will not improve measurement accuracy. That is not the intent of the requirement. An integral part of the BLM's responsibility for gas measurement is to ensure accurate measurement and proper reporting. The purpose of this requirement is to allow our inspectors instant access to the "raw" data from which volume is determined. Using the displayed values required under this paragraph allows BLM inspection personnel to quickly determine if the meter is functioning properly and if the correct parameters have been input. If discrepancies are found, we can then request further documentation to identify the source of the discrepancy. This type of workload prioritization is the only way we can accomplish our goals given our limited number of inspectors.

Obtaining data through a laptop computer, portable data collection unit, or relying on a

company meter technician to provide access will not fulfill our responsibility. Laptop computers and portable data collection units, even if provided to BLM at no cost, are cumbersome and time consuming to use, especially if there are many different makes and models of electronic flow computers to inspect. In addition, these devices provide far more data than are needed to perform a quick initial screening, critical to workload prioritization. Most importantly, a laptop or data collection unit allows some opportunity for data manipulation prior to access by BLM.

BLM cannot rely on the presence of company personnel to provide access to the data. Section 108(b) of The Federal Oil and Gas Royalty Management Act (FOGRMA) requires the BLM be granted immediate access, without advance notice, to facilities for the purpose of determining compliance. No changes were made as a result of this comment.

Comment 16

Several comments cited safety concerns, new Homeland Security requirements, and "tight hole" situations for not providing unrestricted access to BLM. Again, Section 108(b) of FOGRMA requires that BLM be granted immediate access to facilities for determining compliance. No changes were made as a result of this comment.

Comment 17

Several comments expressed concern that existing displays may not be able to meet the new requirements that the NTL is requiring. Most EFCs are already capable of displaying the four parameters required. We are aware that some EFC systems have displays built into the individual transmitters, but do not have flowrate display capability built into the RTU. These systems would be required to modify the RTU to include a display capable of showing instantaneous flowrate. As discussed in comment 15, we feel that this feature is necessary in order for us to fulfill our mandated responsibilities. No changes to the NTL were made as a result of this comment.

Comment 17A

One comment implied that this was a redundant requirement because flowing information is already provided in previous regulation. There is currently in effect a Wyoming NTL for the former Rock Springs District that did require some flowing information to be displayed. However, this pertained only to a specific geographic region and not the entire state. No changes were made as a result of this comment.

Comment 17B

One comment argued that this information is contained in the audit report. Some EFC audit reports include an instantaneous flow calculation at the time the report was pulled. However, this does not meet our intent of being able to perform a quick verification in the field without having to rely on an operator or calibrator to download an audit report

for us. No changes were made as a result of this comment.

Based on Comment 12, the parenthetical wording in this requirement was changed to read: "(Note: This is an additional requirement to API 21.1.5.1.1.3)".

Requirement 5

Comment 18

BLM received one comment stating that many displays are not physically capable of displaying such data as make, range, and model number of the transducers. The intent of this requirement is to have enough data on-site to allow BLM inspectors to calculate an instantaneous flow rate and overall meter uncertainty. Data such as make, range, and model number of the transducers do not have to be part of the display. As long as the information is available, this requirement is met. Most transducers have the range and model number stamped into a tag that is attached to the transducer. This is acceptable as long as the tag is visible without the need for special equipment or company meter personnel present. No changes to the NTL were made as a result of this comment.

Comment 19

BLM received numerous comments requesting clarification as to the format of the requested information. The wording in the NTL was intentionally general to allow flexibility by industry. Our intent is to ensure that enough current information is available to our inspectors to allow the calculation of instantaneous flowrate and to make an uncertainty determination. Therefore, no particular format is required as long as the information is there. For example, if the mean internal diameter of the meter tube is stamped on the flange and is readable, this would suffice. The orifice plate size could be stamped in the paddle for flange fittings, or indicated on a card if another type of orifice fitting was used. As stated above, a stamp or tag attached to the transducer would suffice for make, range, and model number of the transducers. Specific gravity and the calibrated spans of the transducers could also be printed or typed on a card. A printout of the current configuration log would also be acceptable if this information was accessible to the inspector without needing company personnel present. The latest calibration sheet could be kept onsite to satisfy this requirement. No changes to the NTL were made as a result of this comment.

Comment 20

One comment stated that the physical location of the flowing pressure tap is indicated on the transducer and separate documentation is not required. We do not agree with this comment. On many electronic flow computers, especially those using multi-variable transducers, there is no indication as to what tap is used for the determination of flowing pressure. In these cases, the flowing pressure tap location can only be determined by looking at the meter manual or by testing during a verification. Unless the flowing pressure tap location is readily apparent, some form of documentation is required. No

changes were made as a result of this comment.

Comment 21

Some comments requested clarification about posting the specific gravity onsite because sometimes specific gravity is a live input, and specific gravity changes from time to time. All information posted or available onsite must be up-to-date. We believe that the statement "must be maintained onsite" is adequate to clarify the information has to be up to date. The commenter does raise a valid issue with live specific gravity inputs. We feel that this will be a relatively rare occurrence for the points of measurement under BLM jurisdiction, and would best be handled through a variance request. No changes were made as a result of this comment.

Comment 22

One comment expressed confusion and concern over the term "onsite". The commenter states that because of high wind in Wyoming onsite information for the electronic flow computer would have to be placed inside a building in order to protect the documents that we are requiring. In addition, this creates a safety problem for certain types of buildings, and poses safety hazards for untrained personnel entering the buildings.

To clarify, the term "onsite" does indeed mean on location and accessible to BLM inspectors without the need for any special equipment or company personnel present. We do not feel that this would necessitate that the electronic flow computer be placed inside of a building. The information we are requiring is either stamped into the meter components themselves, or could be included on a water and windproof card attached to the meter housing. No changes were made as a result of this comment.

Comment 23

One commenter asked if this information would be subject to the 6 year data retention requirement and, if so, would create additional costs for storage. The answer is "yes", these data would have to be maintained for at least 6 years. Because much of the on-site data would be included in configuration logs, event logs, and volume statements, we do not feel this is a significant burden. No changes were made as a result of this comment.

Based on Comment 12, the parenthetical wording in this requirement was changed to read: "(Note: This is an additional requirement to API 21.1.5.1.1.2)".

Requirement 6

Comment 24

BLM received two comments that noted a discrepancy between the 6-year data retention required by this NTL and the 7-year data retention required in the draft 43 CFR 3100 regulations and the "1996 Federal Oil and Gas Royalty Application and Fairness Act".

The draft 43 CFR 3100 regulations were never approved, therefore, the 7-year data retention proposed in those regulations has no standing. We believe that the commenter is actually referring to the "Federal Oil and Gas Royalty Simplification and Fairness Act of 1996". This Act amends Section 307 of FOGRMA, as it applies to non-Indian leases, changing the statute of limitations from 6 years to 7 years, from the time an error or omission was made. However, no amendments to Section 103(b), requiring a minimum 6-year retention of data, were made by the 1996 Act. Therefore, Section 103(b) remains in effect and no changes to the NTL were made as a result of this comment.

Comment 25

One comment expressed concern that the 6-year data retention requirement is onerous and expensive, and that the Federal Energy Regulatory Commission only requires a 3-year data retention period. Federal oil and gas lessees and operators have a statutory requirement to retain data for 6 years because of Section 103(b) of FOGRMA. To change this requirement would require a legislative amendment to FOGRMA, which is well beyond the scope and authority of this NTL. No changes were made as a result of this comment.

Based on Comment 12, the parenthetical wording in this requirement was changed to read: "(Note: This is an additional requirement to API 21.1.6.8)".

Requirement 7

Comment 26

BLM received 2 comments that asked for further clarification as to what data we are requiring. Generally, the source for this data would be the meter or component manufacturer, although it is the responsibility of the operator to supply the information. The purpose of this information is to allow BLM inspectors to determine whether the equipment was installed properly and is being maintained and calibrated properly. The technical specifications will allow BLM to determine the overall uncertainty and operating limits of the meter. The software algorithms will allow BLM to ensure the meter is in compliance with API 21.1. Because these data are only to be submitted upon request, the operator can ask the BLM for more specific details about the information at the time the request is made. Therefore, we feel the requirement is clear as it stands, and no changes to the NTL were made as a result of this comment.

Comment 27

BLM received 2 comments stating that many meter and component manufacturers would consider software and algorithm details as proprietary and may require the BLM to purchase a license. We believe that the commenters are referring specifically to communication protocols within the meter, which is not the intent of this requirement. As stated in the response to comment 26, the purpose of this requirement is to ensure the

meter is operating in compliance with API 21.1, which applies specifically to flow calculations and averaging methodology, not to communications. We would encourage operators to ensure that the manufacturers of the meters they are using are willing to provide this information to BLM. Failure to provide this information would result in the issuance of an Incident of Non Compliance. No changes were made as a result of this comment.

Requirement 8

Comment 28

Several comments argued that testing the static pressure transmitter/transducer to 100% of calibrated span is not necessary and results in increased costs because a high pressure source is required. These comments suggested that line pressure be the maximum verification pressure for the static pressure transmitter/transducer, especially for low flow wells.

We do not agree with this comment. Onshore Order 5 (III.C.15) requires that a verification be done at 100% of the calibrated span. We believe that testing at 100% of span is not an onerous requirement as most calibrators are equipped with a high pressure source anyway. In addition, we feel that the 100% verification point is important to ensure the linearity of the transmitter/transducer. The commenters did not provide any data to show that testing to 100% of span is unwarranted. Therefore, no changes to the NTL were made because of this comment.

Comment 29

Several commenters also argued that BLM should require the same verification points that are required by API 21.1., i.e. 0%, 50%, 100%, 80%, and 20%. They argued that all these points are necessary to ensure the linearity and hysteresis of the transmitter/ transducer and the function of the analog to digital converter are within accepted tolerance.

While we agree with these comments from a technical standpoint, one of the underlying principals of this NTL is to develop fair and uniform measurement standards, to the extent possible, for all gas measurement systems. Onshore Order 5 specifically requires 0%, 100%, and one point within the normal operating range to be verified for chart recorders. Therefore, we do not feel more stringent requirements should be applied to electronic flow computers because these devices are installed voluntarily by operators. In other words, operators should not be subjected to more rigorous requirements simply because they voluntarily install better equipment. For this reason, we did not make any changes to the NTL as a result of this comment.

Comment 30

One commenter asked if the requirements of the NTL would supercede contracts that require the more stringent verification in API 21.1. The answer is "no". The requirements of this NTL represent minimum standards. Operators are free to exceed these standards. No changes to the NTL were made as a result of this comment.

Based on Comment 12, the parenthetical wording in this requirement was changed to read: "(Note: The inclusion of a verification point at the normal operating pressure is an additional requirement to API 21.1.8.3.1.2 and .3. BLM will not enforce the provisions of API 21.1.8.3.1.2 and .3 that require more verification points than those specified in this requirement)"

Requirement 9

Comment 31

One commenter astutely noted that the requirement to perform a calibration if the transducer/transmitter was off by more than its accuracy specification, could be a disincentive for operators to use more accurate equipment. In other words, better equipment would be held to a higher standard for calibration.

It is true that better equipment will be held to a higher standard as a result of this requirement. However, the advantage for an operator to use better equipment is improved uncertainty, resulting in a larger operating envelope, per requirement 15. No changes to the NTL were made as a result of this comment.

Comment 32

BLM received one comment stating that this requirement is too stringent partially because the accuracy of the calibration equipment should be taken into account. Because API 21.1.8.6 requires that calibration equipment be at least twice as accurate as the equipment being calibrated, we do not feel that this is a significant issue. Actually, this is a less stringent requirement than that found in Onshore Order 5. Onshore Order 5 requires "zero" error. No changes to the NTL were made as a result of this comment.

Comment 33

We received one comment stating that barometric pressure must be accounted for during calibration of the static pressure transducer/transmitter. In other words, if the barometric pressure changed from the time of the prior calibration, the change may be confused with a transducer/transmitter error, even though it is reading properly.

The commenter raises a legitimate point and we recognize the potential for such confusion to occur. Fluctuations in barometric pressure due to weather systems can be as much as 1 psi. BLM has no specific policy on how to set the "zero" point for absolute pressure transducers/transmitters. Onshore Order 5 allows 3 values to be used for atmospheric pressure: 1) a value defined in a buy-sell contract; 2) measured barometric

pressure or; 3) atmospheric pressure based on elevation of the meter. In the absence of a contractually-defined atmospheric pressure, we believe that using a barometer to set the "zero" is appropriate. However, if a barometer is used to set the "zero", it would technically be considered "calibration/verification equipment", subject to the accuracy requirements of API 21.1.8.6.

While no changes to the NTL were made because of this comment, we feel it must be addressed and clarified. Therefore, we will be developing a policy regarding calibration/ verification of the "zero" point for absolute pressure transducers/transmitters in the near future.

Comment 34

One comment suggested that a calibration should only be required if the transducer/ transmitter error exceeds the overall meter uncertainty. We do not agree with the suggestion because the determination of overall meter uncertainty assumes that the transducers/transmitters are properly calibrated. No changes were made as a result of this comment.

Comment 35

One comment suggested that a full span calibration only be required if the as-found indication shows that the transmitter is out of tolerance. In fact, this is what the requirement states. We further defined "out of tolerance" as being outside of the accuracy specification for the device. In reference to a "full span calibration", we do not specify how the calibration is to be done as long as it is in accordance with the manufacturer's specifications. If the manufacturer does not require a full span calibration, then it would not be required by BLM either. No changes were made as a result of this comment.

Comment 36

One commenter asked how this requirement amends API 21.1.8.3. The referenced API standard states: "A calibration will only be necessary…whenever the verification test determines an *unacceptable difference* between the value measured or produced by the certified reference standard and that of the value measured and utilized by the [electronic flow computer]." This requirement in the NTL is an additional requirement because it further defines an "unacceptable difference". No changes were made because of this comment.

Comment 36A

One comment argued that the "as found/as left" tolerances should be based on a percentage of span and should not be tied to the published accuracy specifications of the device. The reasoning for this recommendation was that: 1) actual field performance of transducers/transmitters may not be as good as the specifications because of ambient temperature affects, and; 2) the calculation of volume is less sensitive to differential and

static pressure because of the square root function.

We understand that transducers/transmitters are subject to shifts as ambient temperature changes from the temperature at which the device was calibrated. The specifications for transducers/transmitters include the effects of ambient temperature change on performance. The commenter did not provide any data to suggest that the ambient temperature affects are greater than those specified by the manufacturer. It is true that error discovered during a verification could be due to an ambient temperature shift since the previous calibration. However, it would be unlikely that error discovered during the determination of an "as left" value would be due to ambient temperature changes. The reason is that there is usually a very short time period between the actual calibration and the final "as left" verification. It would be unusual for the ambient temperature to change significantly enough in this short of a time period to cause any perceptible change in the output of the device.

Because the transducer/transmitter accuracy specifications are normally taken at their word for the purpose of overall uncertainty determination, we feel that the device should be able to live up to its performance specifications under a controlled calibration environment.

It is also true that the square root functions of differential and static pressure reduce the sensitivity of these variables on flow rate. However, this sensitivity is accounted for when determining system uncertainty.

We do not fully understand the recommendation of the commenter. We are, in fact, using a percentage of full span as a standard for "as found" and "as left" values. The percentage is directly from the manufacturer's specifications. No additional data was provided that would support any other percentage to be used, therefore, no changes were made as a result.

Based on Comment 12, the parenthetical wording in this requirement was changed to read: "(Note: This is an additional requirement to API 21.1.8.3)".

Requirement 10

Comment 37

Several commenters argued that BLM should require the same "as left" verification points that are required by API 21.1., i.e. 0%, 50%, 100%, 80%, and 20%. They argued that all these points are necessary to ensure the linearity and hysteresis of the transmitter/ transducer and the function of the analog to digital converter are within accepted tolerance.

While we agree with these comments from a technical standpoint, one of the underlying principals of the NTL is to develop fair and uniform measurement standards, to the extent

possible, for all gas measurement systems. Onshore Order 5 specifically requires 0%, 100%, and one point within the normal operating range to be verified for chart recorders. Therefore, we do not feel more stringent requirements should be applied to electronic flow computers because these devices are installed voluntarily by operators. In other words, operators should not be subjected to more rigorous requirements because they voluntarily install better equipment. For this reason, we did not make any changes to the NTL as a result of this comment.

Requirement 11

Comment 38

One comment asked that the timeframe for repairing or replacing a defective transducer/ transmitter be extended to 72 hours. Another comment recommended a 7-day timeframe. No justification or data was presented to defend either the 72-hour or 7-day timeframe proposed. We feel that a 48-hour timeframe should be adequate in most situations. This is actually less stringent than "prior to completion of calibration" as specified by Onshore Order 5 (III.C.19). The 48-hour leeway was included in the NTL to allow for the complexity of the components and the availability of parts. No changes to the NTL were made as a result of this comment.

Comment 39

Another commenter asked what the enforcement action would be if the 48-hour timeframe could not be met. If it meant shutting in the well, the comment states, both the operator and BLM would lose revenue. Unless a variance providing sufficient justification for an extended timeframe is requested and approved, the enforcement action would indeed be to shut the well in. While we realize that this could result in reduced revenue, BLM cannot allow biased measurement to proceed for any longer than is reasonably justified. No changes to the NTL were made as a result of this comment.

Comment 39A

One comment suggested that the timeframe for repair be consistent with Onshore Order 5. The timeframe for repair in Onshore Order 5 is "prior to completion of calibration". Because of the complexity of electronic flow computers and availability of parts, we feel that a 48-hour timeframe is more reasonable. No changes were made as a result.

Comment 39B

One comment suggested that rather than using the performance specification as a threshold for transducer/transmitter replacement, the contribution of the error to overall flow volume be considered.

The contribution of transducer/transmitter uncertainty to overall flow measurement uncertainty is done at the time overall measurement uncertainty is calculated. It is

assumed in this calculation that the transducers/transmitters are properly calibrated. Therefore, to validate this assumption, we must ensure that the transducers/transmitters are, in fact, properly calibrated in the field. If the accuracy specifications given by the transducer/transmitter manufacturer are legitimate, they should not have a difficult time living up to their stated accuracy during a calibration. No changes to the NTL were made as a result of this comment.

Requirement 12

Comment 40

One commenter suggested that the use of a hot and cold bath should be allowed by the NTL.

The NTL does not prohibit the use of a hot and cold bath, as long as one of the baths is near the normal flowing temperature of the gas. Requirements for temperature element verification and calibration are intentionally loose in the NTL. The reason for this is because there are no explicit standards for temperature element verification and calibration in Onshore Order 5. Again, one of the main premises for this NTL was to develop electronic flow computer standards that are commensurate with the chart recorder standards in Onshore Order 5. In Onshore Order 5, continuous temperature measurement is required for wells flowing more than 200 Mcf/day. While no standards for calibration are included, the requirement for temperature measurement implies that some degree of temperature accuracy is desirable. It is this intent which forms the basis for the temperature element requirements in the NTL. However, we feel that rigid standards for temperature element calibration would exceed the intent of the temperature standards for chart recorders. No changes to the NTL were made because of this comment.

Comment 41

One comment argued that it is not possible to calibrate the actual RTD (resistance temperature device), and that industry practice is to simulate the RTD output with resistors in order to calibrate the transducer/transmitter. The commenter goes on to state that because resistors come in a limited number of values, it might not be possible to find one that simulates the “normal flowing temperature of the gas”.

We do not disagree with this comment and we feel that the wording in the NTL does not prohibit the use of simulated temperatures using resistors. Note that the wording in the NTL requires finding an “as found” reading for the temperature transducer/transmitter, not the actual temperature probe. To further accommodate simulated temperatures, we changed the wording in Requirement 13 from “test thermometers”, to “test devices”.

As described under Comment 40, the requirements for temperature element calibration will be loosely interpreted, specifically when it comes to obtaining an as found reading

"near" the normal flowing temperature of the gas. However, the operator should be aware that whatever value is chosen to represent a temperature near the normal flowing temperature, will be used to calculate volume error. No changes were made based on this comment.

Comment 42

BLM received one comment stating that this requirement does not address "legacy installations" that may not have a temperature well located near the electronic flow computer, and may not have a temperature well in the same flow stream. We feel that this type of system would be a violation of Onshore Order 5 and would not be allowed on a meter where BLM has jurisdiction, unless a variance has been requested and approved. We feel the comment is beyond the scope of the NTL, therefore, no changes were made to the NTL.

Comment 43

One commenter asked how this requirement supercedes API 21.1.8.3.1.4. The answer is that the API citation does not specifically require an "as found" value at the normal flowing temperature of the gas, whereas the NTL does. As a result of this comment, and the concerns raised in Comment 12, the parenthetical statement was changed to read: "(Note: The requirement for an "as found" measurement at the normal flowing temperature of the gas is an additional requirement to API 21.1.8.3.1.4. Provisions of API 21.1.8.3.1.4 beyond this requirement will not be enforced by BLM)".

Requirement 13

Comment 44

Several comments requested that the "as left" threshold for replacing a temperature transducer/transmitter be changed from ±0.5°F to either ±1°F or ±2°F. The commenters stated that the ±0.5°F requirement was too restrictive considering the small effect that temperature error has on overall volume error.

Because of the lack of specificity regarding temperature element standards in Onshore Order 5 for chart recorders, we agree with this comment, and changed the threshold to ±2°F. In addition, we added the following parenthetical statement to clarify the difference between the NTL and API 21.1: "(Note: Provisions of API 21.1.8.3.1.4 exceeding the requirements of this paragraph will not be enforced by BLM.)"

Comment 45

BLM received two comments questioning the 48-hour timeframe for replacing or repairing the temperature transducer/transmitter. One comment asked that the timeframe be extended to 72 hours, although no justification for 72 hours was included.

The basis for this requirement is from Onshore Order 5 (III.C.19) which requires correction to zero error prior to the completion of calibration. This requirement refers to the "measuring equipment", which includes the temperature element. Therefore, the 48-hour timeframe is actually more lenient than it is under Onshore Order 5, and applies equally to all the transducers/transmitters. Because Requirement 10 specifies a 48-hour time frame for the differential and static pressure transducers/transmitters, the same timeframe will also apply to the temperature transducer/transmitter for consistency. Therefore, no changes were made based on this requirement.

Comment 46

Another commenter asked what the enforcement action would be if the 48-hour timeframe could not be met. If it meant shutting in the well, the comment stated, both the operator and BLM would lose revenue. Unless a variance is requested that provided sufficient justification for an extended timeframe, the enforcement action would indeed be to shut the well in. While we realize that this could result in reduced revenue, BLM cannot allow biased measurement to proceed for any longer than is reasonably justified. No changes to the NTL were made as a result of this comment.

As stated in comment 41, the wording of this requirement was changed from "test thermometers", to "test devices".

Requirement 14

Comment 47

One comment stated that it makes no sense to design to a 3% error limit while requiring calibration to less than 2%. We are unclear as to the point being made by the commenter, however, it appears that there is some confusion between meter uncertainty and calibration error. The 3% uncertainty limit in Requirement 15 is completely independent and different from a 2% volume error limit in Requirement 14. This requirement simply requires an amended volume to be reported if the volume error determined during a calibration or verification is greater than 2%. The determination of uncertainty is dependent on the individual accuracies of the meter components and assumes that the transducers/transmitters are properly calibrated. No changes were made as a result of this comment.

Comment 48

Another comment stated that the measurement limit should be scaled for high and low flow rate and flow volume and not by a blanket statement of 2% or 3%. Again, we are not clear on the point being made by the commenter. The requirement for submitting amended reports if a volume error greater than 2% was discovered during calibration is consistent with Onshore Order 5. Changing this 2% threshold is beyond the scope of this NTL. The only difference between this requirement and that in Onshore Order 5 was a minor modification of wording to clarify the point at which volume error is determined.

No changes were made as a result of this comment.

Comment 49

One comment suggested changing the wording of the requirement to "If this time is unknown, volumes shall be corrected for the last half of the period elapsed since the date of last verification or calibration." If the prior "as found" condition of the meter was acceptable, then no calibration would have been performed. We agree with this comment and made the change suggested by the commenter.

Comment 50

BLM received one comment that requested the threshold for submitting amended reports be changed from 2% to 100-250 MMBtus. The rationale is that a 2% error in a low volume well would require more work than is justified by the small change in royalty. Changing the threshold from 2% to an MMBtu basis would have to be applied to all gas meters, not just orifice plates with electronic flow computers. Therefore, this requested change is beyond the scope of this NTL and no changes were made as a result.

Requirement 15

Comment 51

One commenter stated that the requirement to maintain system uncertainty calculations for each installation for audit purposes was unreasonable. This requirement does not necessitate the calculation and maintenance of uncertainty calculations for each installation. To implement this requirement, BLM is working to develop a program which would generate an "operating envelope" for the differential and static pressure elements of the meter. As long as the elements were operated inside the envelope, uncertainty would be better than the ±3% required. Therefore, an uncertainty calculation would only be required when meter parameters were changed or when a meter was operating close to edge of the envelope. No changes to the NTL were made as a result of this comment.

Comment 52

Numerous comments asked for further clarification as to the calculation of uncertainty and the components that make up uncertainty. The comments also included a request that BLM develop a standard method for uncertainty determination. Because no wording changes to the requirement itself were requested or justified, no changes to the NTL were made as a result of these comments. However, BLM will be developing a user-friendly, web-based program to standardize and simplify uncertainty determination.

Comment 53

One comment argued that the calculation of uncertainty per AGA Committee Report No.

3, Part 1, 1991, only covers the uncertainty of the AGA equation and does not include the uncertainty of the complete system. We assume that by "complete system", the commenter is referring to the tertiary element, since the AGA equations (Part 1.12) do include the effects of the primary and secondary elements. We tend to agree with this comment if a very literal interpretation of the uncertainty calculation in AGA Committee Report No. 3, Part 1, is assumed. However, we believe that the equations presented by AGA show the general procedure to be used to arrive at an overall system uncertainty at a 95% confidence level. While the specific examples in AGA do not include averaging or ambient temperature effects of the tertiary element, these can easily be included using the same methodology. We feel the requirement in the NTL was clear as written, while still allowing sufficient flexibility to include inaccuracies due to the tertiary element. Therefore, no changes to the NTL were made as a result of this comment.

Comment 54

One comment stated that the uncertainty requirement is specific to the EFC only. We do not agree with this comment. The reference cited (AGA Committee Report No. 3, Part 1, 1991) presents an uncertainty determination method which includes both primary and secondary element effects. For example, uncertainties associated with the discharge coefficient, the meter tube diameter, and the orifice diameter, are all part of the primary element and are included in the AGA equations. As pointed out in a previous comment, the AGA equation does not specifically include uncertainty associated with the tertiary element, but these can easily be added. No changes to the NTL were made as a result of this comment.

Comment 55

One comment stated that uncertainty should be expressed for both volumetric and energy rates. The result of the uncertainty calculation is a percent of true flowrate. It shouldn't matter if the flowrate is being expressed in volumetric terms or energy terms; the percentage would remain the same. The only additional source of uncertainty for an energy rate would be the Btu content of the gas. Although BLM does ensure the correct energy content of the gas is reported, our policy is to verify monthly volumes, not total energy produced. Therefore, we feel the wording of the NTL is clear as is and no changes were made as a result of this comment.

Comment 56

One comment asked if BLM was going to require third party testing and certification of electronic flow computers, to ensure the accuracy of their gas flowrate calculations. BLM feels that this is an excellent suggestion and would be willing to pursue a certification process in the future. We would look to the industry to develop a standard electronic flow computer testing protocol and certification process. At such time as a standard was developed, BLM would consider adopting the standard. For the purposes of this NTL, and considering that the development of a testing standard is a future endeavor, we do not see the need to adjust the wording of this requirement or include an additional

requirement at this time. As a result, no changes to the NTL were made as a result of this comment.

Comment 57

One commenter argued that the determination of uncertainty is a complex topic subject to the whims and opinions of the person doing the calculation. The comment goes on to state that, as a result, the determination of uncertainty does not always provide practical and useable information relating to flow measurement.

Although we feel the comment may be overstated, to some extent we agree with the point being made. We realize that there is some degree of subjectiveness when doing an uncertainty determination. By working with industry and a third party to develop an uncertainty model, we believe we can mitigate the commenter's concerns. In general, BLM feels strongly that overall uncertainty is the fairest and most objective way to regulate gas measurement. The only alternative is to develop arbitrary standards specific to each technology. This would end up punishing operators wishing to use better equipment, while still missing the overall goal of accurate measurement. Because the commenter does not offer specific alternatives to the requirement or to the wording of the requirement, no changes to the NTL were made.

Comment 58

One comment asked that this requirement be deleted because "true flowrate" is unknown. Instead, it was suggested that uncertainty be expressed in terms of confidence level. First, we believe that defining uncertainty in terms of a percentage of "true flowrate" is proper. Uncertainty, as defined by API 21.1.2.2.2, is "the amount by which an observed or calculated value may depart from the true value". We feel that the API definition is consistent with the wording in this requirement. Second, it is understood that by using the uncertainty methodology presented in AGA Committee Report No. 3, Part 1, 1991, the resulting calculation is at the 95% confidence level. Therefore, the uncertainty requirement is being expressed in terms of confidence level as the commenter suggested. No changes to the NTL were made as a result of this comment.

Comment 58A

Several commenters suggested that BLM impose operating limits on the minimum allowable percent of span for differential pressure and static pressure transmitters. The recommended limits were 5%, 5", and 10" for differential pressure and 10% of span for static pressure. We recognize that operating a transducer/transmitter at the low end of the scale is a primary contributor to poor meter performance. However, given the wide variety of transducers/transmitters on the market today, we do not feel that adopting a set limit is the best approach. Using overall uncertainty takes into consideration all contributors to uncertainty and will allow better transducers/transmitters a larger operating range. No changes were made as a result of these comments.

Requirement 16

Comment 59

One commenter suggested that a fixed low-flow cutoff of 0.5" was a practical limit because of pulsation, nicked or dull orifice plates, flow conditioner obstructions, tap hole obstructions, leaking orifice plate seals, wrong plate thickness, and line surges. We do not understand how any of these conditions, with the possible exception of pulsation, are relevant to low-flow cutoff. If there is a difference in pressure between the upstream and downstream tap, there will be flow. Plate condition, flow conditioner obstructions, leaking orifice seals, and line surges will not eliminate flow due to the pressure difference. While the calculation of flow under these very low differential conditions is difficult, we know that the flow must be something greater than zero. The only justification for allowing a low-flow cutoff is to eliminate false flow due to transmitter/ transducer drift. We will not allow a low-flow cutoff to be used to eliminate differential pressure that really does exist. No changes to the NTL were made as a result of this comment.

Comment 60

Several comments expressed an opinion that the establishment of any fixed low-flow cutoff is impractical. We do not agree. Low flow cutoffs that are set higher than necessary to account for false differential readings due to transducer/transmitter drift will result in unaccounted volumes of federal or Indian resources being removed from the lease. BLM feels that a standard for low-flow cutoff is necessary and practical. No changes were made as a result of this comment.

Comment 61

Several comments argued that using the basic accuracy specification for a low-flow cutoff limit is not adequate because other factors including analog to digital conversion, temperature changes, and time in service can affect transmitter/transducer performance. Some of these comments also suggested a low-flow cutoff of 0.5".

We realize that other factors such as ambient temperature, static pressure, and time in service can affect differential pressure transducer/transmitter performance beyond the basic accuracy specification. Unfortunately, none of the commenters provided any data or justification as to why a fixed low-flow cutoff of 0.5" should be adopted.

It seems there is some justification to include ambient temperature, static pressure, and time in service considerations in the allowable low-flow cutoff. Unfortunately, we also need a standard that is practical and easy to implement. A detailed transducer/transmitter uncertainty analysis for the purpose of establishing a low flow cutoff is not practical to implement.

Because industry did not submit any data to support their position of a fixed 0.5” low flow cutoff, we performed our own analysis by modeling the affects of reasonable amounts of ambient temperature, static pressure, and stability affects on the basic transducer/transmitter accuracy specification. Based on this analysis, we feel a factor of 1.5 times the basic transducer/transmitter accuracy specification addresses industry’s concerns while still providing a simple and objective standard that we can enforce. Adopting an upper limit of 0.5”, as industry recommended, will encourage the use of better equipment and help ensure that all gas removed from federal and Indian property is accounted for.

The wording of the NTL is changed to read: “Unless otherwise approved by BLM, the low flow cutoff shall not be set higher than 1.5 times the manufacturer’s basic uncertainty specification for the differential pressure transducer/transmitter, expressed in inches of water column, or 0.5”, whichever is less.”

Comment 62

BLM received two comments stating that vibration from compressors or plunger cycles can cause false differential readings. One of the comments suggested that the low flow cutoff in these cases be determined by closing the downstream block valve and observing the differential reading.

We do not disagree that there may be some affect from sources of vibration that could cause false differential readings. However, an operator experiencing these problems may also have the option of moving the transducer/transmitter to isolate it from the vibration source. If that is not an option, then an operator could ask BLM for a variance and offer the proposed technique to determine an appropriate low flow cutoff. We do not feel that the commenter provides sufficient justification to warrant a blanket approval of an elevated low flow cutoff due to vibration, and no changes to the NTL were made as a result.

Comment 63

One commenter stated that the use of the transducer/transmitter accuracy specification could encourage operators to use less accurate equipment because the requirement would be more lenient. While we agree that this is a possibility, the advantage of using more accurate equipment is that the operator will get a larger operating envelope. This type of trade off will have to be weighed by the operator. In addition, the adoption of an upper limit (0.5”) for the low flow cutoff will encourage the use of better equipment. No changes to the NTL were made as a result of this comment.

Comment 64

One comment recommended that the low-flow cutoff provision in API 21.1 be followed. This provision adopts the cutoff determined in the contract based on a realistic

assessment of site conditions.

We do not feel that this provision in API 21.1 provides sufficient guidance for BLM to ensure that gas is being measured before leaving federal and Indian leases. Gas sales contracts are often based on negotiated terms and do not necessarily represent the best gas measurement practice. We believe a specific minimum standard is necessary as a default. If the operator can demonstrate that site conditions are such that a variance is necessary, then this would also be acceptable. However, by requiring a site specific justification to be submitted with the variance request, BLM can ensure that site conditions really do warrant a higher value for low-flow cutoff and that the intent of this requirement is being met. No changes to the NTL were made as a result of this comment.

Comment 65

Numerous comments requested that BLM waive the Onshore Order 5 requirement for quarterly calibration frequency (III.C.17) for EFCs and, instead, require a 6-month calibration frequency. Two commenters submitted some data which supported a 6-month calibration frequency for the EFCs they used. While we believe that many EFCs on the market today are capable of maintaining their accuracy for six months, we feel this is an issue relative to specific brands of EFCs, and we have insufficient data on all makes and models to make a blanket 6-month requirement for all EFCs covered by this NTL. This is especially true because this NTL is retroactive to all EFCs, regardless of their age. BLM field offices may approve a 6-month calibration frequency through the variance process, provided the operator supplies sufficient information to justify the variance.