

COMMONWEALTH OF KENTUCKY

BEFORE THE  
KENTUCKY PUBLIC SERVICE COMMISSION

In the matter of: )  
)
  
THE ELECTRONIC APPLICATION OF )  
COLUMBIA GAS OF KENTUCKY, INC. FOR: 1) A )  
DECLARATION THAT CONSTRUCTION OF A LOW )  
PRESSURE SYSTEM SAFETY IMPROVEMENT IS AN )  
EXTENSION OF ITS SYSTEM IN THE ORDINARY ) Case No. 2019-00257  
COURSE OF BUSINESS; 2) IN THE ALTERNATIVE, )  
FOR THE ISSUANCE OF A CERTIFICATE OF PUBLIC )  
CONVENIENCE AND NECESSITY FOR SUCH )  
CONSTRUCTION; 3) APPROVAL OF AN )  
AMENDMENT AND EXPANSION OF ITS )  
ACCELERATED MAIN REPLACEMENT TARIFF TO )  
ITS SAFETY MODIFICATION AND REPLACEMENT )  
TARIFF; AND (4) APPROVAL TO MODIFY THE 2019 )  
AMRP CONSTRUCTION PLAN )

VERIFIED APPLICATION

Comes now Columbia Gas of Kentucky, Inc. ("Columbia"), by counsel, pursuant to KRS 278.020, KRS 278.509, 807 KAR 5:001, and other applicable law, and does hereby submit its application for the Commission to declare that certain ongoing construction is an extension of its system in the ordinary course of business; or, in the alternative, to issue a Certificate of Public Convenience and Necessity ("CPCN"); approve an amendment of

its accelerated main replacement tariff; and approve a modification of its 2019 Accelerated Main Replacement Program (“AMRP”) construction plan, respectfully stating as follows:

## I. INTRODUCTION

1. Columbia began a program, referred to as the low pressure gas distribution system safety enhancement program (the “LP Program”) in October 2018, following a review of an incident that occurred in Massachusetts in 2018. The initial work included small investments in labor to gather information used for design and threat assessment. The resulting LP Program was initiated at an estimated cost of approximately \$11.2 million in capital, which equates to approximately 3.28% of Columbia’s net plant value. This represents a very modest investment in the distribution system. However, it is intended to make Columbia’s distribution system safer and more resilient over the long-term.

2. Based upon Commission precedent and the unique facts of the LP Program, when Columbia initiated the LP Program it did not believe that a CPCN was necessary. However, when the Commission entered an Order in a recent case involving another

natural gas local distribution company,<sup>1</sup> Columbia determined that it would be prudent and appropriate to seek a declaration that a CPCN is not required for the LP Program or, in the alternative, that a CPCN should be issued. Columbia has slowed the pace of the ongoing LP Program in order to clarify whether a CPCN is necessary, but safety considerations and contractual obligations make it undesirable to pause or terminate the LP Program.<sup>2</sup>

3. Columbia also seeks permission to amend and expand its existing Accelerated Main Replacement Program Tariff (“Tariff AMRP”) to recognize the expanded nature of its safety enhancements. Columbia seeks to include system safety modifications and investments in a new Safety Modification and Replacement Program Tariff (“Tariff SMRP”).<sup>3</sup> If approved, Tariff SMRP will allow Columbia to reduce regulatory lag associated with capital investments that improve the safety and reliability of its system. While only the LP Program improvements would be within the expanded scope of the proposed Tariff SMRP presently, it is possible that Columbia may request approval in future years to include other safety and regulatory compliance projects in the Tariff SMRP. Finally, Columbia requests authority to modify its 2019 AMRP construction

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<sup>1</sup> See *In the Matter of the Electronic Application of Atmos Energy Corporation for an Increase in Rates*, Order, Case No. 2018-00281 (Ky. P.S.C. May 7, 2019).

<sup>2</sup> Columbia does not expect to exceed investment in excess of two percent (2%) of its net plant value for several months, thereby giving the Commission adequate opportunity to consider the substance of this Application.

<sup>3</sup> A copy of the proposed Tariff SMRP is attached hereto and incorporated herein as Exhibit 1.

plan to include the LP Program,<sup>4</sup> thereby deferring recovery of its 2019 LP Program investments until 2020.

4. The safety aspects of the LP Program are tangible and will benefit Columbia, its customers and the communities it serves. Accordingly, Columbia respectfully requests that the Commission promptly enter an Order so that the LP Program may resume at a pace for completion of the project in three years. Though Columbia recognizes that cases of this nature often take longer to adjudicate, Columbia respectfully requests the Commission to enter an Order within **ninety (90) days** from the date the Application is accepted for filing.

## II. BACKGROUND

### A. Overview of Columbia Gas

5. Columbia provides natural gas service to over 135,000 customers in thirty (30) Kentucky counties. Columbia invests heavily in its communities, not just in public utility infrastructure, but also in supporting local charitable activities and economic development efforts. Columbia has built a solid track record for delivering natural gas in a safe, efficient and reliable manner.

6. Columbia is a wholly-owned subsidiary of NiSource Distribution Group, which is itself a wholly-owned subsidiary of NiSource Inc. (“NiSource”). NiSource is a

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<sup>4</sup> Columbia’s 2019 AMRP Construction Plan was approved in *In the Matter of the Electronic Accelerated Main Replacement Program Filing of Columbia Gas of Kentucky, Inc.*, Order, Case No. 2018-00341 (Ky. P.S.C. Dec. 5, 2018).

registered holding company under the Public Utility Holding Company Act of 2005, with its principal office located at 801 East 86<sup>th</sup> Avenue, Merrillville, Indiana, 46410.

### **B. Filing Requirements**

7. Pursuant to 807 KAR 5:001, Section 14(1), Columbia states that its full name, mailing address and email address are as follows:

Columbia Gas of Kentucky, Inc.  
2001 Mercer Road  
P.O. Box 14241  
Lexington, Kentucky 40512-4241  
pscemailcky@niscource.com

8. In addition, Columbia requests that its retained counsel be served via email at the following email addresses:

mdgoss@gosssamfordlaw.com;  
david@gosssamfordlaw.com; and  
allyson@gosssamfordlaw.com.

9. Pursuant to 807 KAR 5:001, Section 14(2), Columbia states that it was incorporated on October 11, 1905, is a corporation organized and existing under the laws of the Commonwealth of Kentucky and that it is currently in good standing within the Commonwealth.

### **C. Description of the LP Program**

10. Columbia currently has fifty-two (52) low pressure gas delivery systems, comprising 515 miles of low pressure main serving approximately 40,000 customers in sixteen (16) counties and twenty-three (23) municipalities. The distinguishing features of

a low pressure system are that it operates at a gas pressure below one psig and pipeline pressure is controlled by a district station rather than a regulator device closer to the customer's premises. Under the Code of Federal Regulations, no person may operate a low pressure distribution system: (a) at a pressure high enough to make unsafe the operation of any connected and properly adjusted low pressure gas burning equipment; or (b) at a pressure lower than the minimum pressure at which the safe and continued operation of any connected and properly adjusted low pressure equipment can be assured.<sup>5</sup> Consistent with the Code, Columbia utilizes four general control configurations at district stations to achieve over-pressure protection: wide-open monitor/control regulator, working monitor/control regulator, wide-open monitor/control regulator/secondary relief valve, and control regulator/primary relief valve.

11. Even though Columbia's existing system complies with all applicable authorities and is a safe and reliable source of natural gas service, the LP Program is a key element of Columbia's proposed Safety Management System, which is itself a comprehensive set of standards and best practices for the oil and natural gas industries based on the successful implementation of similar programs in the transportation, airline and nuclear industries. The SMS system is based on the American Petroleum Institute's Recommended Practice 1173. Following an incident in Massachusetts involving a low

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<sup>5</sup> See 49 C.F.R. 192.623.

pressure system, Columbia identified the LP Program as a prudent investment for achieving overall risk reduction.

12. Phase I of the LP Program's capital investments is currently underway and includes installing automatic shut-off devices as the primary form of over pressure protection in all of Columbia's low pressure systems. Also, on two small systems, Columbia will be installing low pressure gas regulators on facilities supplying those customers that perform the same function as the overpressure equipment at the district station. Columbia will also be installing electronic instrumentation at each district LP station that can sense abnormal operating conditions and inform NiSource's Gas Control should one of these automatic shut-off devices activate. Phase I of the project is estimated to cost \$11,152,514.

13. Under Phase I of the LP Program there are 204 regulator stations within Columbia's low pressure systems that will be retrofitted or rebuilt to install automatic shut off valves and monitoring capabilities. Columbia believes the added protection is consistent with, and in the spirit of, continuously assessing and implementing measures intended to reduce risks as required by the Gas Distribution Pipeline Integrity Management elements described in Subpart P of 49 CFR Part 192, and Part 192.1007 (5)(d) in particular. After the successful implementation of the LP Program, the regulator used will continuously guard against exceedingly high pressures that could cause hazardous conditions in the low pressure systems that supply Columbia's customers. Moreover,

these regulators are designed to react to those conditions before any adverse effects to customers or their appliances occurs.

14. As of June 30, 2019, Columbia has installed 80 automatic shut-off valves at a cost of \$1,579,200. Columbia has yet to begin installing electronic instrumentation for remote monitoring. While this level of capital investment is somewhat lower than what Columbia anticipated before issuance of the Commission's most recent precedent on CPCNs, this investment demonstrates Columbia's commitment to improving its system. Moreover, the LP Program's incremental impact upon Columbia's operations and maintenance expense is \$87,368. Due to the modest nature of the total investment in the LP Program, Columbia is financing the ongoing efforts through internally available funds and/or debt issuances previously approved by the Commission. No additional financing is planned at this time. Columbia is using contract crews to accomplish the tasks associated with the LP Program work.

#### **D. Uncertainty Following Case No. 2018-00281**

15. Columbia acknowledges and appreciates the Commission's long-standing support of programs to accelerate the deployment of enhancements to natural gas distribution systems that enhance safety and reliability. Beginning with Case No. 2001-



00092,<sup>6</sup> the Commission recognized the value of this effort, even before a specific statute was enacted in KRS 278.509 to affirm the Commission's authority in this regard.<sup>7</sup> Indeed, the Commission most recently held:

The Commission has consistently found that the public interest is served by replacing potentially unsafe, aged gas pipelines through the adoption of pipeline replacement programs that have been approved as being fair, just, and reasonable. To the extent that the pipeline eligible for replacement poses a safety risk to the utility's customers, service areas, and employees, the Commission reiterates that it is in favor of accelerated replacement. The Commission believes that pipeline replacement programs improve public safety and reliability of service for customers.<sup>8</sup>

16. The LP Program is entirely consistent with the spirit of the Commission's historical endorsement of efforts to make natural gas systems safer. However, the Commission's Order in Case No. 2018-00281 also stated:

The Commission has also frequently found, based on specific facts presented by a utility, that the construction of a proposed facility, other than an office building, is in the ordinary course of business and does not require a CPCN if the cost represents less than two percent of the utility's net utility plant, and will not require financing approval by the Commission.<sup>9</sup>

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<sup>6</sup> See *In the Matter of: Adjustment of Gas Rates of the Union Light, Heat & Power Co.*, Order, Case No. 2001-00092, (Ky. P.S.C. Jan. 31, 2002)

<sup>7</sup> See *Kentucky Public Service Comm'n v. Com. ex rel. Conway*, 324 S.W.3d 373 (Ky. 2010).

<sup>8</sup> See Order, Case No. 2018-00281, p. 14 (Ky. P.S.C. May 7, 2019).

<sup>9</sup> *Id.*, pp. 55-56.

17. As set forth above, the LP Program represents an approximate \$11.2 million investment (approximately 3.28% of the utility's net assets) in safety enhancements. The Order in Case No. 2018-00281 creates doubt as to whether a CPCN is necessary based upon the Commission's articulation of a new "two percent" standard. Columbia interprets the Commission's Order as continuing the long line of precedent that holds that ordinary course extension questions should be reviewed based upon their own unique facts,<sup>10</sup> and that the particular circumstances present in Case No. 2018-00281 have not given rise to a new black letter law standard that lacks flexibility and omits room for critical judgment. However, if the two percent standard set forth in the Order in Case No.

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<sup>10</sup> See e.g. *In the Matter of: Application of Navitas Ky NG, LLC for Approval of Transportation Agreement with Fsr Servs., LLC to Construct Pipeline Extension in Albany, Clinton County, Kentucky*, Order, Case No. 2016-00065 (Ky. P.S.C. Apr. 15, 2016):

Navitas's most current Annual Report on file with the Commission shows net gas utility plant in service of \$216,919, so the proposed \$200,000 project represents a significant increase in the monetary value of the Navitas system.<sup>9</sup> However, other aspects of the FSR Project such as the prepayment from FSR, the lack of need for external financing, and the level of incremental revenue contribution over the ten-year contract period alleviate the Commission's concern regarding the capital outlay for the FSR project in comparison to the level of Navitas's net utility plant.

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For these reasons, the proposed construction qualifies under 807 KAR 5:001, Section 15(3), as an extension in the ordinary course of business, and we find the construction to be exempt from the requirement of a CPCN under KRS 278.020(1).

*See also In the Matter of the Tariff Filing of Warren County Water District to Establish the Rockfield School Sewer Capital Recovery Fee*, Order, Case No. 2012-00269 (Ky. P.S.C. Nov. 19, 2012) (Finding a project costing 2.1% of the utility's plant to be an ordinary course extension); *In the Matter of: Application of Carroll County Water Dist. # 1 for Approval of Interlocal Agreements & for Auth. to Incur Debt*, Case No. 2014-00174 (Ky. P.S.C. July 21, 2014) ("Finding that projects totaling \$1.5 million were extensions in the ordinary course based upon the utility's 'gross utility plant of approximately \$15.9 million and net utility plant of approximately \$10.3 million.'"); *In the Matter of: Application of W. Carroll Water Dist. for Approval of Interlocal Agreements & for Auth. to Authorize the Execution of A Note for This Project*, Order, Case No. 2014-00053 (Ky. P.S.C. Apr. 14, 2014) (Finding that projects totaling \$1.5 million were extensions in the ordinary course based upon the utility's "gross plant in service of approximately \$4.5 million and net plant in service of approximately \$2.2 million"); *but see In the Matter of: Springcrest Sewer Co., Inc. Request for Deviation from 807 Kar 5:071, Section 7(4)*, Order, Case No. 2014-00277 (Ky. P.S.C. Dec. 16, 2014) (a utility in addition in excess of ten percent would not be an ordinary course extension).

2018-00281 is inflexible, then it is necessary for Columbia to seek a CPCN for Phase I of the LP Program.

### **III. Request for a Declaration that a CPCN is Not Required for the LP Program**

18. Columbia undertook the LP Program in good faith in the belief that a CPCN was not required. The factors to be considered when evaluating whether a project is an extension in the ordinary course of business are fourfold. A utility and the Commission must determine: (1) whether the project creates wasteful duplication of plant, equipment, property, or facilities; (2) whether the project conflicts with the existing certificates or service of other utilities operating in the same area and under the jurisdiction of the commission that are in the general or contiguous area in which the utility renders service; (3) whether the project involves sufficient capital outlay to materially affect the existing financial condition of the utility; and (4) whether the project will result in increased charges to its customers.<sup>11</sup> The LP Program satisfies each of these criteria.

19. The LP Program is an improvement of Columbia's existing distribution system and does not involve the expansion of its system beyond its present locations. Rather, the LP Program makes the existing distribution system safer by mitigating risks associated with low pressure systems. There will be no wasteful duplication of plant, equipment, property or facilities.

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<sup>11</sup> See 807 KAR 5:001, Section 15(3).

20. The LP Program will not conflict with the existing service of other utilities either. The LP Program is an enhancement of Columbia's distribution system, and does not expand Columbia's system. The LP Program will have no impact whatsoever on the service provided by other natural gas distribution companies.

21. The total estimated expense associated with the LP Program is approximately \$11.2 million. The elements of this estimate are further described in the testimony of Columbia witness Gary Sullivan, however, it is quickly evident that this modest investment pales in comparison to Columbia's total net assets, which were \$ 339,513,396 as of December 31, 2018.<sup>12</sup> Thus, the LP Program represents an investment equivalent to only 3.28% of Columbia's total net assets. Plainly, this is not a sufficient amount of investment to have a material impact upon Columbia's financial condition.

22. The final element to consider is whether the LP Program will result in increased charges to customers. While virtually all utility investments eventually find their way into rates paid by customers, there is no plan by Columbia to immediately increase customer charges by virtue of undertaking the LP Program. As detailed in the testimony of Columbia witness Judy Cooper, Columbia desires to continue the LP Program through 2019 and then seek recovery of the costs actually incurred as part of its March 2020 true-up filing. This will assure that any future cost recovery is incremental and gradual and based upon costs that are known and measurable.

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<sup>12</sup> See *Columbia's* FERC Form 2 (Mar. 29, 2019), p. 110, line 10.

23. Based upon the foregoing, it should be apparent that the LP Program satisfies each of the criteria for declaring it to be an extension of Columbia's system in the ordinary course of business. But for the Commission's recent decision in Case No. 2018-00281, Columbia would not have filed this application. However, especially in light of the Commission's recent precedent and Columbia's desire for transparency, slowing the pace of the LP Program and seeking a declaration that a CPCN is not necessary is the prudent course of action.

#### **IV. Alternative Request for a CPCN, if Needed**

##### **A. Filing Requirements**

24. Columbia requests a declaration that a CPCN is not necessary for the LP Program, however, in the event that the Commission disagrees, Columbia offers the following information.

25. The LP Program does not involve a bid on a franchise, therefore no information is required to be filed pursuant to 807 KAR 5:001 Section 15(1).

26. As the LP Program involves the extension of its existing system, pursuant to 807 KAR 5:001 Section 15(2)(a), Columbia relies upon the facts set forth herein, including the testimony and exhibits attached hereto.

27. Pursuant to 807 KAR 5:001, Section 15(2)(b), Columbia has determined that no permits are required for the LP Program. Accordingly, there are no permits to attach hereto.

28. Pursuant to 807 KAR 5:001, Section 15(2)(c), Columbia has provided a full description of the LP Program in paragraphs ten (10) through twenty-three (23) herein and in the testimony of the following Company witnesses: Dave Monte and Gary Sullivan. As set forth therein, the LP Program will not compete with any other public utilities, corporations or persons.

29. Pursuant to 807 KAR 5:001, Section 15(2)(d), Columbia is filing a PDF copy and two (2) paper copies of: suitably scaled maps showing the location or route of the proposed construction or extension, as well as the location to scale of like facilities owned by others located anywhere within the map area with adequate identification as to the ownership of the other facilities; and plans, specifications and drawings of the proposed plant, equipment, and facilities associated with the LP Program.

30. Pursuant to 807 KAR 5:001, Section 15(2)(e) and (f), Columbia describes the manner in which it is financing the LP Program and provides the estimated annual cost of operations of the LP Program after it is placed in service in paragraph fourteen (14) herein. Both points are further described in the testimony of witnesses Judy Cooper and Gary Sullivan.

## B. CPCN Criteria

31. KRS 278.020 is silent with regard to the criteria which the Commission should apply to any request for a CPCN from a utility. Accordingly, case law construing KRS 278.020(1) provides the appropriate standard for evaluating Columbia's request for a CPCN in this proceeding if one is necessary. The leading authority on CPCNs is *Kentucky Utilities Co. v. Public Service Comm'n*, which articulates a two-part test for demonstrating entitlement to a CPCN: (1) need; and (2) absence of wasteful duplication. *Kentucky Utilities Co.* provides significant guidance as to what further considerations should be taken into account when evaluating a request for a CPCN under these two criteria.

32. As to "need," Kentucky's highest Court wrote:

We think it is obvious that the establishment of convenience and necessity for a new service system or a new service facility requires first a showing of a substantial inadequacy of existing service, involving a consumer market sufficiently large to make it economically feasible for the new system or facility to be constructed and operated. Second, the inadequacy must be due either to a substantial deficiency of service facilities, beyond what could be supplied by normal improvements in the ordinary course of business; or to indifference, poor management or disregard of the rights of consumers, persisting over such a period of time as to establish an inability or unwillingness to render adequate service.<sup>13</sup>

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<sup>13</sup> *Kentucky Utilities Co.*, at 890.

33. The need for the LP Program relates to the imperative to enhance the safety of Columbia's low pressure natural gas distribution system in Kentucky. Columbia's actions result from an incident that occurred with an affiliate in Massachusetts that involved an over-pressure event. As stated previously, Columbia believes the added over-pressure protection proposed is consistent with and in the spirit of continually assessing and implementing measures to address risks as they emerge as required by the Gas Distribution Integrity Management elements described in Subpart P of 49 CFR Part 192 and Part 192.1007 (5)(d) in particular.

34. With regard to what constitutes "wasteful duplication," the Court opined:

[W]e think that 'duplication' also embraces the meaning of an excessive investment in relation to productivity or efficiency, and an unnecessary multiplicity of physical properties, such as right of ways, poles and wires. An inadequacy of service might be such as to require construction of an additional service facility to supplement an inadequate existing facility, yet the public interest would be better served by substituting one large facility, adequate to serve all the consumers, in place of the inadequate existing facility, rather than constructing a new small facility to supplement the existing small facility. A supplementary small facility might be constructed that would not create duplication from the standpoint of an excess of capacity, but would result in duplication from the standpoint of an excessive investment in relation to efficiency and a multiplicity of physical properties.<sup>14</sup>

35. In evaluating the "wasteful duplication" aspect of CPCN analysis, the Court further instructed, "[w]e are of the opinion that the Public Service Commission

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<sup>14</sup> *Id.*, at 891.



should have considered the question of duplication from the standpoints of excessive investment in relation to efficiency, and an unnecessary multiplicity of physical properties.”<sup>15</sup> While the avoidance of “wasteful duplication” is a primary consideration for evaluating a request for a CPCN, *Kentucky Utilities Co.* makes clear that the Commission must not focus exclusively upon the cost of a proposal alone. The Commission must also look at an application for a CPCN in relation to the service to be provided by the utility:

[W]e do not mean to say that *cost* (as embraced in the question of duplication) is to be given more consideration than the need for *service*. If, from the past record of an existing utility, it should appear that the utility cannot or will not provide adequate service, we think it might be proper to permit some duplication to take place, and some economic loss to be suffered so long as the duplication and resulting loss be not greatly out of proportion to the need for service.<sup>16</sup>

36. In other words, the complete absence of “wasteful duplication” need not be shown to an absolute certainty, “it is sufficient that there is a reasonable basis of anticipation” that the “consumer market in the immediately foreseeable future will be sufficiently large to make it economically feasible for a proposed system or facility to be constructed....”<sup>17</sup> As recently as 2012, the Commission affirmed this point:

To demonstrate that a proposed facility does not result in wasteful duplication, we have held that the applicant must demonstrate that a thorough review of all alternatives has

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<sup>15</sup> *Id.*

<sup>16</sup> *Id.*, at 892 (emphasis in original).

<sup>17</sup> *Kentucky Utilities Co. v. Public Service Commission*, 59 P.U.R.3d 219, 390 S.W.2d 168, 172 (Ky. 1965).

been performed. Selection of a proposal that ultimately costs more than an alternative does not necessarily result in wasteful duplication. All relevant factors must be balanced.<sup>18</sup>

37. The LP Program clearly satisfies the wasteful duplication element of the CPCN criterion. As set forth in the testimony of Columbia witness Dave Monte, the system improvements will be applied to Columbia's existing distribution system and will not result in any new customers or pipeline extensions. Moreover, the LP Program will not interfere with any other utility's ability to serve its customers or lead to wasteful replication of utility facilities. To the contrary, the LP Program is for targeted investment in the existing distribution system to make it safer and more reliable.

38. If the Commission concludes that the LP Program is not an extension in the ordinary course of business and that a CPCN is required, Columbia relies upon the foregoing information and incorporated testimony and exhibits, and respectfully requests the Commission to issue a CPCN.

#### **V. Request to Amend and Expand Tariff AMRP to Tariff SMRP**

39. Columbia proposes to amend and expand its existing Tariff AMRP to include safety modifications, thereby making the tariff a Safety Modification and Replacement Tariff. This expansion of the tariff is consistent with the original goal of

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<sup>18</sup> *In re the Application of Big Rivers Electric Corporation for Approval of its 2012 Environmental Compliance Plan*, Case No. 2012-00063, Final Order, pp. 14-15 (Ky. P.S.C. Oct. 1, 2012) (citations omitted).

Tariff AMRP, which was to accelerate the deployment of prudent investments in the safety and reliability of natural gas systems.

40. The new Tariff SMRP would cover the work typically and historically associated with pipeline replacement programs and system safety modifications, which Columbia currently identifies through Optimain. While only the investment associated with LP Program is at issue in this proceeding, Columbia reserves the right to bring additional safety modification investments to the Commission for consideration and approval on an annual basis in the future under an amended and expanded tariff. Such investments may be identified through Columbia's proposed implementation of SMS.

41. Columbia notes that the proposed Tariff SMRP is consistent with other recently approved tariffs filed by other jurisdictional natural gas utilities. Examples include: Louisville Gas & Electric Company's ("LG&E") establishment of a Gas Line Tracker ("GLT") Rider;<sup>19</sup> Duke Energy Kentucky, Inc.'s transition of its AMRP to an Accelerated Service Line Replacement Program;<sup>20</sup> LG&E's addition of a Transmission Modernization Program and Steel Service Line Replacement Program to its GLT Rider;<sup>21</sup>

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<sup>19</sup> See *In the Matter of the Application of Louisville Gas and Electric Company for an Adjustment of its Electric and Gas Rates, a Certificate of Public Convenience and Necessity, Approval of Ownership of Gas Service Lines and Risers, and a Gas Line Surcharge*, Order, Case No. 2012-00222 (Ky. P.S.C. Dec. 20, 2012).

<sup>20</sup> See *In the Matter of the Application of Duke Energy Kentucky, Inc. for a Certificate of Public Convenience and Necessity Authorizing the Implementation of an Accelerated Service Line Replacement Program, Approval of Ownership of Service Lines, and a Gas Pipeline Replacement Surcharge*, Order, Case No. 2015-00210 (Ky. P.S.C. Feb. 2, 2016).

<sup>21</sup> See *In the Matter of the Application of Louisville Gas & Electric Company for an Adjustment of its Electric and Gas Rates and for Certificates of Public Convenience and Necessity*, Order, Case No. 2016-00371 (Ky. P.S.C. June 22, 2017).

and Atmos Energy Corporation's use of its Pipeline Replacement Program to replace a non-cast iron or bare steel line in Shelby County.<sup>22</sup>

42. Tariff SMRP as proposed is fair, just and reasonable and Columbia respectfully requests the Commission to approve it.

#### **VI. Request to Amend the 2019 AMRP Construction Plan**

43. Columbia proposes to amend its 2019 AMRP construction plan to include the LP Program. Columbia would then continue the work that is ongoing within the LP Program throughout 2019 and then seek recovery of those costs in the course of its next tariff true-up filing, which is slated to be made in March of 2020. In this way, Columbia's customers will not be charged for any improvements for over a year following the implementation of the LP Program. Moreover, LP Program costs incurred in 2020 would be sought as part of Columbia's October 2019 annual filing.

44. In expanding the scope of the tariff to a true Tariff SMRP, Columbia remains committed to completing the original thirty-year replacement timeline associated with its current AMRP Program. The investments associated with the LP Program will not interfere with Columbia's pipeline replacement schedule.

#### **VII. Overview of Testimony**

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<sup>22</sup> See *In the Matter of the Application of Atmos Energy Corporation to Establish PRP Rider Rates for the Twelve Month Period Beginning October 1, 2014*, Order, Case No. 2014-00274 (Ky. P.S.C. 2014-00274).

45. Columbia supports the foregoing information with testimony provided by the following witnesses:

- a. Kimra H. Cole, Columbia's President and Chief Operating Officer, offers testimony describing Columbia's operations in Kentucky and the importance of the LP Program to Columbia, its customers and the communities it serves;
- b. Dave Monte, NiSource Senior Vice President for Safety, Environmental, Engineering and Training, offers testimony describing the LP Program in detail, its origin, the need for the program and the approach Columbia has taken towards implementing the LP Program;
- c. Judy Cooper, Columbia's Director of Government and Regulatory Affairs, offers testimony describing the amendment to Tariff AMRP to make it Tariff SMRP and the financing and cost recovery elements of the proposal; and
- d. Gary Sullivan, Columbia's Manager of Field Engineering, offers testimony concerning the technical details of the LP Program.

### **VIII. Request for Expedited Treatment**

46. Columbia is eager to clarify the question of whether a CPCN is required to complete Phase I of the LP Program in light of the Commission's recent Order establishing a two percent (2%) threshold. The importance and value of the LP Program's

investments is self-evident and dictates that Columbia should be diligent in pursuing implementation of the work. While acknowledging the Commission's heavy caseload and reduced staffing, Columbia respectfully requests a decision from the Commission within ninety (90) days from the date this Application is accepted for filing.

## **IX. Conclusion**

47. The LP Program is vital to assuring that Columbia continues to be able to provide safe, reliable and efficient service to its customers. The LP Program qualifies as an extension of Columbia's system in the ordinary course of business under the factors set forth in the Commission's regulation. However, if a CPCN is needed, the facts and testimony offered herein demonstrate that the LP Program is needed and will not result in wasteful duplication. Moreover, Columbia's request to amend its Tariff AMRP to include safety modifications as an amended and expanded Tariff SMRP is fair, just and reasonable and should be approved. Allowing the LP System to be included in the 2019 AMRP Construction Plan will support this effort. Columbia requests expedited review of this application so that it may resume the scheduled pace of enhancing its system's safety through the LP Program.

WHEREFORE, on the basis of the foregoing, Columbia respectfully requests the Commission to:

- 1) Declare that a CPCN is unnecessary for the LP Program to continue;
- 2) In the alternative, issue a CPCN for the LP Program;

- 3) Authorize the amendment and expansion of the existing Tariff AMRP to become the Tariff SMRP as proposed herein;
- 4) Authorize inclusion of the LP Program in the 2019 AMPR construction plan;  
and
- 5) Award all other relief to which it may be entitled.

Done this 29<sup>th</sup> day of July, 2019.

**VERIFICATION**

The undersigned hereby verifies that all the information contained in this foregoing application is true and correct to the best of my knowledge, opinion and belief, formed after due inquiry.

COLUMBIA GAS OF KENTUCKY, INC.

BY: Kimmet Cole

ITS: President & COO



Respectfully submitted,

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*Counsel for Columbia Gas of Kentucky, Inc.*

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Exhibit 1

Proposed Tariff SMRP

~~AMRP-SMRP RIDER~~  
~~ACCELERATED-SAFETY MAIN-MODIFICATION AND~~ REPLACEMENT PROGRAM RIDER

I  
I

**APPLICABILITY**

Applicable to all customers receiving service under the Company's Rate Schedules GS, IS, IUS, SVGTS, DS and SAS.

**CALCULATION OF ~~ACCELERATED-SAFETY MAIN-MODIFICATION AND~~ REPLACEMENT RIDER REVENUE REQUIREMENT**

I

The ~~AMRP-SMRP~~ Rider Revenue Requirement includes the following:

- a. ~~AMRP-SMRP~~-related Plant In-Service not included in base gas rates minus the associated ~~AMRP-SMRP~~-related accumulated depreciation and accumulated deferred income taxes;
- b. Retirement and removal of plant related to ~~AMRP-SMRP~~ construction;
- c. The rate of return on the net rate base is the overall rate of return on capital authorized in the Company's latest base gas rate case, grossed up for federal and state income taxes;
- d. Depreciation expense on the ~~AMRP-SMRP~~ = related Plant In-Service less retirement and removals;
- e. Property taxes related to the ~~AMRP-SMRP~~; and
- f. Reduction for savings in Account No. 887 – Maintenance of Mains,

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**~~ACCELERATED-SAFETY MAIN-MODIFICATION AND~~ REPLACEMENT PROGRAM FACTORS**

All customers receiving service under Rate Schedules GSR, GSO, IS, IUS, SVGTS, DS, GDS and SAS shall be assessed a monthly charge in addition to the Customer Charge component of their applicable rate schedule that will enable the Company to complete the ~~accelerated-safety main-modification and~~ replacement program.

I  
I

Rider ~~AMRP-SMRP~~ will be updated annually in order to reflect the expected impact on the Company's revenue requirements of forecasted net plant additions and subsequently adjusted to true up the actual costs with the projected costs.- A filing to update the projected costs for the upcoming calendar year will be submitted annually by October 15 to become effective with meter readings on and after the first billing cycle of January. The allocation of the program costs shall be based on the revenue distribution approved by the Commission. Company will submit a balancing adjustment annually by March 31 to true-up the actual costs, as offset by operations and maintenance expense reductions, during the most recent twelve months ended December with the projected program costs for the same period. The balancing adjustment true-up to the rider will become effective with meter readings on and after the first billing cycle of June.

The charges for the respective gas service schedules effective May 31, 2019 are:

Rate GSR, Rate SVGTS - Residential Service	\$-3.32	<del>R</del>
Rate GSO, Rate GDS, Rate SVGTS - Commercial or Industrial Service	\$-12.40	<del>R</del>
Rate IUS, Rate IUDS	\$-103.34	<del>R</del>
Rate IS, Rate DS <sup>1/</sup> , Rate SAS	\$-649.39	<del>R</del>

<sup>1/</sup> - Excluding customers subject to Flex Provisions of Rate Schedule DS

DATE OF ISSUE: ~~March~~July 29, 2019

DATE EFFECTIVE: ~~August 14~~28, 2019 ~~May 31, 2019~~  
 (Unit 1 June Billing)

ISSUED BY: ~~/s/ Herbert A. Miller, Jr.~~ /s/ Kimra H. Cole

TITLE: President and Chief Operating Officer

**SMRP RIDER  
SAFETY MODIFICATION AND REPLACEMENT PROGRAM RIDER**

T  
T

**APPLICABILITY**

Applicable to all customers receiving service under the Company's Rate Schedules GS, IS, IUS, SVGTS, DS and SAS.

**CALCULATION OF SAFETY MODIFICATION AND REPLACEMENT RIDER REVENUE REQUIREMENT**

T

The SMRP Rider Revenue Requirement includes the following:

- a. SMRP-related Plant In-Service not included in base gas rates minus the associated SMRP-related accumulated depreciation and accumulated deferred income taxes;
- b. Retirement and removal of plant related to SMRP construction;
- c. The rate of return on the net rate base is the overall rate of return on capital authorized in the Company's latest base gas rate case, grossed up for federal and state income taxes;
- d. Depreciation expense on the SMRP = related Plant In-Service less retirement and removals;
- e. Property taxes related to the SMRP; and
- f. Reduction for savings in Account No. 887 – Maintenance of Mains,

T  
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T

**SAFETY MODIFICATION AND REPLACEMENT PROGRAM FACTORS**

T

All customers receiving service under Rate Schedules GSR, GSO, IS, IUS, SVGTS, DS, GDS and SAS shall be assessed a monthly charge in addition to the Customer Charge component of their applicable rate schedule that will enable the Company to complete the safety modification and replacement program.

T

Rider SMRP will be updated annually in order to reflect the expected impact on the Company's revenue requirements of forecasted net plant additions and subsequently adjusted to true up the actual costs with the projected costs. A filing to update the projected costs for the upcoming calendar year will be submitted annually by October 15 to become effective with meter readings on and after the first billing cycle of January. The allocation of the program costs shall be based on the revenue distribution approved by the Commission. Company will submit a balancing adjustment annually by March 31 to true-up the actual costs, as offset by operations and maintenance expense reductions, during the most recent twelve months ended December with the projected program costs for the same period. The balancing adjustment true-up to the rider will become effective with meter readings on and after the first billing cycle of June.

T

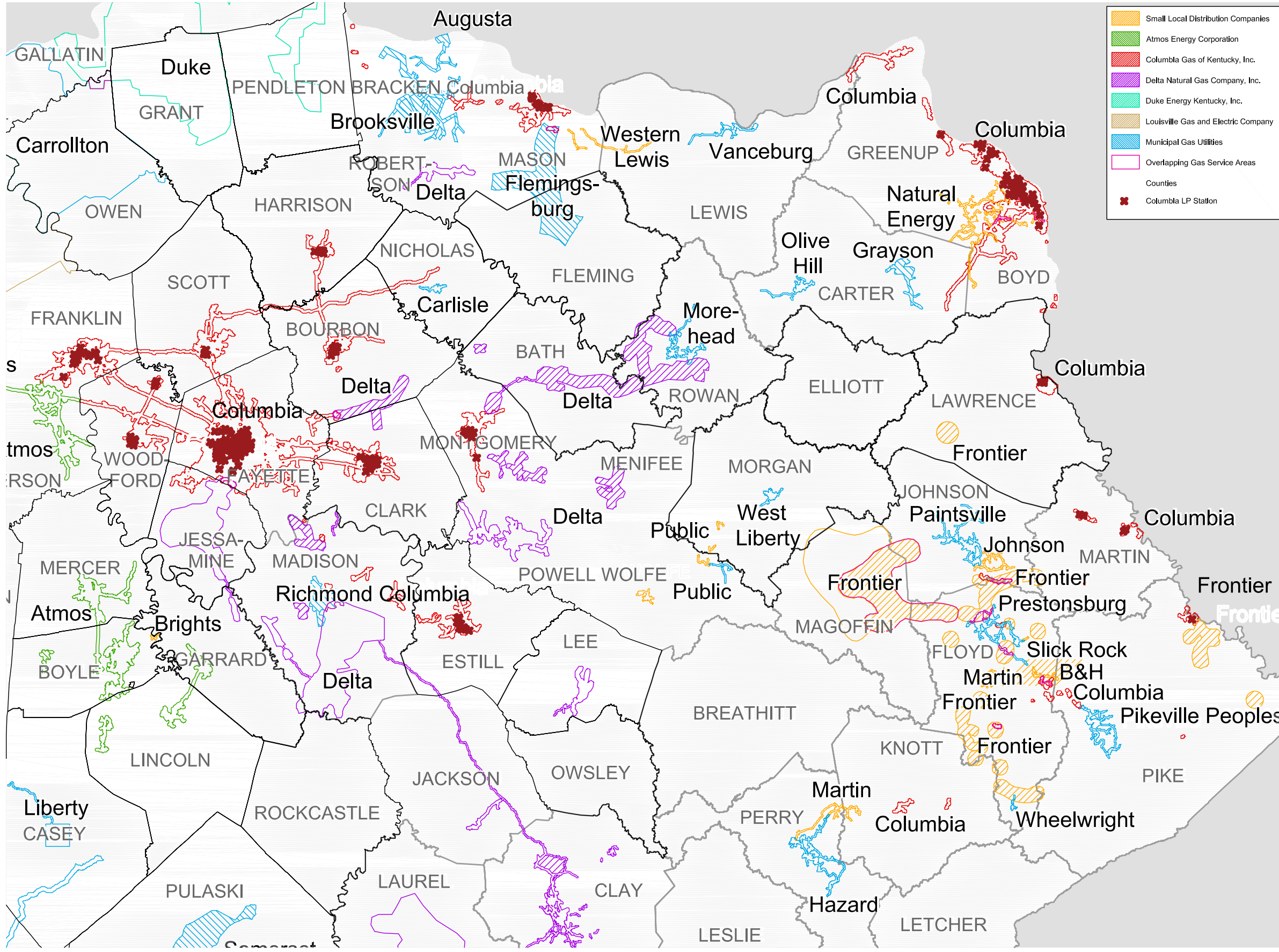
The charges for the respective gas service schedules effective May 31, 2019 are:

Rate GSR, Rate SVGTS - Residential Service	\$3.32
Rate GSO, Rate GDS, Rate SVGTS - Commercial or Industrial Service	\$12.40
Rate IUS, Rate IUDS	\$103.34
Rate IS, Rate DS <sup>1/</sup> , Rate SAS	\$649.39
<u>1/</u> - Excluding customers subject to Flex Provisions of Rate Schedule DS	

DATE OF ISSUE: July 29, 2019  
DATE EFFECTIVE: August 28, 2019  
ISSUED BY: /s/ Kimra H. Cole  
TITLE: President and Chief Operating Officer

Exhibit 2

Map



- Small Local Distribution Companies
- Atmos Energy Corporation
- Columbia Gas of Kentucky, Inc.
- Delta Natural Gas Company, Inc.
- Duke Energy Kentucky, Inc.
- Louisville Gas and Electric Company
- Municipal Gas Utilities
- Overlapping Gas Service Areas
- Counties
- Columbia LP Station



Know what's below.  
Call before you dig.

REVISIONS

REV. #	DATE	DESCRIPTION

DESIGNED BY			
DRAWN BY	X	X	X
CHECKED BY	X	X	X
AS-BUILT BY	X	X	X
	NAME	DATE	PHONE #

DRAWING TITLE:  
OVERVIEW SHEET

DRAWING NO:  
O-1

Exhibit 3

Testimony of Kimra H. Cole



**COMMONWEALTH OF KENTUCKY**

**BEFORE THE PUBLIC SERVICE COMMISSION**

In the matter of:

THE ELECTRONIC APPLICATION OF COLUM- )  
 BIA GAS OF KENTUCKY, INC. FOR: 1) A DECLARA- )  
 TION THAT CONSTRUCTION OF A LOW PRESSURE )  
 SYSTEM SAFETY IMPROVEMENT IS AN EXTENSION )  
 OF ITS SYSTEM IN THE ORDINARY COURSE OF BUSI- )  
 NESS; 2) IN THE ALTERNATIVE, FOR THE ISSUANCE )  
 OF A CERTIFICATE OF PUBLIC CONVENIENCE AND )  
 NECESSITY FOR SUCH CONSTRUCTION; 3) AP- )  
 PROVAL OF AN AMENDMENT AND EXPANSION OF )  
 ITS ACCELERATED MAIN REPLACEMENT TARIFF TO )  
 ITS SAFETY MODIFICATION AND REPLACEMENT )  
 TARIFF; AND (4) APPROVAL TO MODIFY THE 2019 )  
 AMRP CONSTRUCTION PLAN )

Case No. 2019-00257

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**PREPARED DIRECT TESTIMONY OF  
 KIMRA H. COLE  
 ON BEHALF OF COLUMBIA GAS OF KENTUCKY, INC.**

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**July 29, 2019**

Attorneys for  
**COLUMBIA GAS OF KENTUCKY, INC.**

**PREPARED DIRECT TESTIMONY OF KIMRA H. COLE**

1   **Q:   Please state your name and business address.**

2   A:   My name is Kimra H. Cole and my business address is 2001 Mercer Road,  
3       Lexington, Kentucky, 40511.

4  
5   **Q:   What is your current position and what are your responsibilities?**

6   A:   Since July 1, 2019, I have served as the President and Chief Operating Of-  
7       ficer for Columbia Gas of Kentucky, Inc. (“Columbia”) and as a member of  
8       its Board of Directors. My responsibilities include the general operation of  
9       the natural gas distribution utility in 30 Kentucky counties, and specifically  
10      all regulatory, legislative and corporate affairs, business strategy, policy  
11      matters, customer relations, external and public matters associated with the  
12      utility service of Columbia.

13  
14   **Q:   What is your educational background?**

15   A:   I graduated from the University of Kentucky, earning a Bachelor of Science  
16      Degree in Chemical Engineering in 1987 and a Master of Business Admin-  
17      istration Degree in 1995.

18

1 **Q: Please describe your employment history.**

2 A: I joined Columbia as an Industrial Marketing Engineer in 1987. I held vari-  
3 ous management roles of increasing responsibility over a 15-year period  
4 with Columbia. I left the company in 2002 with the title of Director of Sales,  
5 Marketing, Engineering and Operational Services. In 2007, I joined the Lex-  
6 ington-Fayette Urban County Government in the role of Commissioner of  
7 General Services where I had the responsibility for Parks and Recreation,  
8 Fleets, Facilities and other shared functions for the City of Lexington for a  
9 four-year term. My next position was with the Kentucky Public Service  
10 Commission as the Director of Engineering from 2011-2012. I then rejoined  
11 Columbia as the Operations Center Manager in 2012, and held that role un-  
12 til 2015 when I was promoted to Vice President and General Manager of  
13 Columbia. In 2017, I was promoted to the role of Vice President of Distribu-  
14 tions Operations for our parent company, NiSource Inc. (“NiSource”)  
15 where I was responsible for a staff of approximately 400 employees. I left  
16 that role to return to Columbia in my current role as President and Chief  
17 Operating Officer.

18

1 **Q: Have you previously testified before any regulatory commissions?**

2 A: Yes, I have testified before the Kentucky Public Service Commission in nu-  
3 merous cases representing Columbia Gas of Kentucky.

4

5 **Q: What is the purpose of your testimony?**

6 A: The purpose of my testimony is to provide the Commission with a brief  
7 summary of Columbia, including an overview of Columbia's safety culture  
8 and related initiatives. I also summarize the relief that Columbia is seeking  
9 in this case.

10

11 **Q: Please summarize the business of Columbia.**

12 A: Columbia is one of seven natural gas local distribution companies in the  
13 NiSource family of utility companies. Headquartered in Lexington, Ken-  
14 tucky, it is largely the result of a long history of consolidations of other nat-  
15 ural gas distribution companies. The result is a system made up of various  
16 different types of pipe installed during different time periods. Columbia  
17 serves approximately 135,700 customers in 30 Kentucky counties. It pro-  
18 vides natural gas service to residential, commercial and industrial custom-  
19 ers through approximately 2,650 miles of mains, in the counties and munic-  
20 ipalities listed in the Tariff.

1 NiSource is headquartered in Merrillville, Indiana and was created  
2 by the mergers of Northern Indiana Public Service Company and Bay State  
3 Gas Company in 1998, and the Columbia Energy Group in 2000. NiSource  
4 is a registered public utility holding company subject to the jurisdiction of  
5 the Federal Energy Regulatory Commission.

6

7 **Q: Describe Columbia's Safety Culture.**

8 A: Columbia's long-term focus on continuous improvement in safety perfor-  
9 mance is rooted in its safety culture. Columbia and all NiSource companies,  
10 aspire to be an industry leader in safety. This is our foremost stakeholder  
11 commitment and it guides our daily work activities in the field, as well as  
12 investments in safety.

13 Our aspiration to be an industry leader in safety does not reflect a  
14 goal to outperform our peer companies, rather it is about being a partner  
15 and leader in pursuit of critical shared safety goals for the natural gas in-  
16 dustry. Columbia's safety commitment applies to all aspects of safety: cus-  
17 tomers, employees, business partners, and the communities Columbia  
18 serves. It reflects a continual focus on personal safety of people, pipeline  
19 safety for the public, and the health and wellness assured through respon-  
20 sible environmental stewardship.

1 NiSource is an active participant in industry associations and safety  
2 programs including the American Gas Association's ("AGA") Safety Man-  
3 agement Systems working group as well as AGA's peer review/ best prac-  
4 tice program.

5

6 **Q: What initiatives comprise Columbia's safety culture?**

7 A: Initiatives included as part of Columbia's safety culture are infrastructure  
8 modernization, damage prevention, public awareness, integrity manage-  
9 ment programs and safety technology research and development.

10

11 Infrastructure Modernization

12 In 2008 Columbia established an infrastructure modernization program to  
13 replace bare steel and cast iron gas mains as well as customer service lines  
14 with modern plastic and coated steel pipe. This is the ongoing replacement  
15 program ("AMRP") currently funded through Tariff Rider AMRP ("Tariff  
16 AMRP").

17

1        Damage Prevention

2        Columbia has a multifaceted approach to preventing excavation damage to  
3        its gas facilities. It has increased its external outreach to customers, first re-  
4        sponders, public officials and excavators with enhanced communications  
5        and educational programs that focus on the leading causes of facility dam-  
6        age. In addition, we have implemented a damage prevention model in-  
7        tended to predict likely future damages based upon the history of the area,  
8        the contactor and the pipe.

9

10       Public Awareness

11       In addition to damage prevention focused awareness activities, Columbia  
12       conducts Public Awareness Surveys to drive key programs around gas  
13       odor detection, appliance safety and carbon monoxide detection.

14

15       Integrity Management Programs

16       Columbia’s Transmission Integrity Management and Distribution Integrity  
17       Management programs have driven the creation of several public safety  
18       programs in addition to infrastructure modernization and damage preven-  
19       tion including GPS of critical facilities.

20



1        Safety

2                    Columbia is implementing a Safety Management System (“SMS”),  
3        which is a comprehensive approach to identifying risks and managing  
4        safety. Witness Dave Monte’s testimony will provide greater detail regard-  
5        ing our SMS adoption. Additionally, Columbia is implementing a low pres-  
6        sure gas distribution system safety enhancement program (“LP Program”),  
7        which is a targeted effort to reduce the risk of an overpressure event and to  
8        provide safer delivery of gas to customers on our low pressure systems.

9

10    **Q:    Has Columbia begun work on its LP Program?**

11    A:    Yes. As further explained by witness Gary Sullivan, Columbia began work  
12        in October 2018, following a review of an incident that occurred in Massa-  
13        chusetts in 2018.

14

15    **Q:    Did Columbia obtain a Certificate of Public Convenience and Necessity**  
16        **(“CPCN”) prior to beginning work on the LP Program?**

17    A:    No. When Columbia initiated the LP Program, Columbia did not believe  
18        that a CPCN was necessary given Commission precedent and the unique  
19        aspects of the LP Program. However, following the Commission’s recent

1 decision in a case involving a natural gas local distribution company, Co-  
2 lumbia believes it to be prudent to seek a declaration that a CPCN is not  
3 required for its LP Program or, in the alternative, that a CPCN should be  
4 issued based upon the information filed in this docket.

5

6 **Q: Has Columbia stopped work on the LP Program while it seeks a ruling**  
7 **on the CPCN issue?**

8 A: While Columbia has slowed the pace of the LP Program while seeking clar-  
9 ity on the CPCN issue from the Commission, it has not stopped or paused  
10 the LP Program given safety considerations and contractual obligations.

11

12 **Q: What is Columbia proposing in this filing?**

13 A: As described above, Columbia is seeking a declaratory order that a CPCN  
14 is not needed for the implementation of its LP Program, or in the alternative  
15 an order granting a CPCN based on the information filed in this docket.  
16 Additionally, Columbia is seeking authority to amend Tariff AMRP to in-  
17 clude safety modifications, such as the LP Program, in a new Safety Mod-  
18 ernization and Replacement Program Tariff ("Tariff SMRP"). In addition,  
19 Columbia is requesting permission to amend the 2019 AMRP Construction  
20 Plan to include the LP Program investments. Columbia is also asking the

1 Commission to rule on its Application within ninety (90) days so that pro-  
2 gress on improving the system is not delayed.

3

4 **Q: Is the proposed Tariff SMRP part of Columbia's continued commitment**  
5 **to safety?**

6 A: Yes, safety is the pinnacle of Columbia's proposed Tariff SMRP. The LP  
7 Program provides tangible safety benefits to Columbia's customers, com-  
8 munities it serves and all stakeholders. The details of the program and ben-  
9 efits will be covered in Witnesses Gary Sullivan, Dave Monte and Judy  
10 Cooper's testimony.

11

12 **Q: Does this complete your Prepared Direct testimony?**

13 A: Yes, however, I reserve the right to file rebuttal testimony if necessary.

**COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION**

In the matter of: )  
)  
THE ELECTRONIC APPLICATION OF COLUMBIA GAS OF )  
KENTUCKY, INC. FOR: 1) A DECLARATION THAT )  
CONSTRUCTION OF A LOW PRESSURE SYSTEM SAFETY )  
IMPROVEMENT IS AN EXTENSION OF ITS SYSTEM IN THE )  
ORDINARY COURSE OF BUSINESS; 2) IN THE ALTERNATIVE,)  
FOR THE ISSUANCE OF A CERTIFICATE OF PUBLIC ) Case No. 2019-00257  
CONVENIENCE AND NECESSITY FOR SUCH )  
CONSTRUCTION; 3) APPROVAL OF AN AMENDMENT AND )  
EXPANSION OF ITS ACCELERATED MAIN REPLACEMENT )  
TARIFF TO AN ACCELERATED SAFETY AND )  
REPLACEMENT TARIFF; AND (4) APPROVAL TO MODIFY )  
THE 2019 AMRP CONSTRUCTION PLAN )

CERTIFICATE AND AFFIDAVIT

The Affiant, Kimra H. Cole, being duly sworn, deposes and states that the prepared testimony attached hereto and made a part hereof, constitutes the prepared direct testimony of this affiant in the above-captioned matter, and that if asked the questions propounded therein, this affiant would make the answers set forth in the attached prepared direct pre-filed testimony.

  
\_\_\_\_\_  
Kimra H. Cole

COMMONWEALTH OF KENTUCKY

COUNTY OF FAYETTE

SUBSCRIBED AND SWORN to before me by Kimra H. Cole on this the 26<sup>th</sup> day of July, 2019.

Evelyn Long Hill  
Notary Public

My Commission expires: 5/15/2022

Exhibit 4

Testimony of Dave Monte

**COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION**

In the matter of: )  
 )  
 THE ELECTRONIC APPLICATION OF COLUMBIA GAS )  
 OF KENTUCKY, INC. FOR: 1) A DECLARATION THAT )  
 CONSTRUCTION OF A LOW PRESSURE SYSTEM )  
 SAFETY IMPROVEMENT IS AN EXTENSION OF ITS )  
 SYSTEM IN THE ORDINARY COURSE OF BUSINESS; 2) )  
 IN THE ALTERNATIVE, FOR THE ISSUANCE OF A CER- )  
 TIFICATE OF PUBLIC CONVENIENCE AND NECESSITY ) Case No. 2019-00257  
 FOR SUCH CONSTRUCTION; 3) APPROVAL OF AN )  
 AMENDMENT AND EXPANSION OF ITS ACCELER- )  
 ATED MAIN REPLACEMENT TARIFF TO ITS SAFETY )  
 MODIFICATION AND REPLACEMENT )  
 TARIFF; AND (4) APPROVAL TO MODIFY THE 2019 )  
 AMRP CONSTRUCTION PLAN )  
 )

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**PREPARED DIRECT TESTIMONY OF  
DAVID A. MONTE  
ON BEHALF OF COLUMBIA GAS OF KENTUCKY, INC.**

---

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**July 29, 2019**

Attorneys for  
**COLUMBIA GAS OF KENTUCKY, INC.**



**PREPARED DIRECT TESTIMONY OF DAVID A. MONTE**

1   **Q:   Please state your name and business address.**

2   A:   My name is David A. Monte and my business address is 290 Nationwide  
3       Boulevard, Columbus, Ohio 43215.

4  
5   **Q:   What is your current position and what are your responsibilities?**

6   A:   I am employed by NiSource Corporate Services Company, and my current  
7       position is the Sr. Vice President Safety, Environmental, and Training. My  
8       principal responsibilities include leading the corporate safety function in  
9       the development of programs and plans to improve safety culture and per-  
10      formance for all of the NiSource Inc. ("NiSource") companies, including  
11      Columbia Gas of Kentucky ("Columbia"). I am responsible for activities  
12      such as incident reporting, investigation and remediation, safety training,  
13      emergency incident response, communications, root cause analysis, indus-  
14      trial hygiene, lessons learned calls, local safety teams and compliance to Oc-  
15      cupational Safety and Health Administration ("OSHA") laws. The safety  
16      team also provides support for the benchmarking, tracking reporting, anal-  
17      ysis, leading and lagging metrics and indicators, near miss reporting, trend  
18      analysis and OSHA reporting. I also lead our environmental team in

1 providing the training and support required to assure compliance with ap-  
2 plicable federal, state and local environmental laws, the remediation of en-  
3 vironmental legacy issues and environmental permitting to support our on-  
4 going operations and capital investments. I also lead our field technical  
5 training team that trains all field level employees and customer operations  
6 employees. The team also provides training development and learning  
7 strategy for all company functions.

8

9 **Q: What is your educational background?**

10 A: I hold a bachelor's degree in electrical engineering from Union College in  
11 Schenectady, New York and a Masters of Business Administration from  
12 Franklin University in Columbus, Ohio.

13

14 **Q: Please describe your employment history?**

15 A: I joined the Columbia Gas distribution companies in 1990 as an engineer. In  
16 2000, I assumed responsibility for technical operations as a Vice President for  
17 Columbia Gas of Ohio. In that position, I oversaw a variety of technical func-  
18 tions including construction and engineering services, pipeline construction  
19 contracts and measurement and regulation field services. This position was  
20 later expanded to include responsibility for all six NiSource gas distribution

1 companies. In 2006, I was promoted to General Manager of Columbia Gas of  
2 Ohio and Columbia Gas of Kentucky, with responsibility for all field opera-  
3 tions in the two states. In March 2012, I was promoted to Chief Operating  
4 Officer of our Gas Distribution Segment in which I lead a multi-state opera-  
5 tions organization of 3500 employees to deliver natural gas service to 3 mil-  
6 lion residential, commercial and industrial customers. Responsibilities in-  
7 cluded field operations, engineering, construction, customer operations,  
8 pipeline safety, compliance, safety and training across a six state operating  
9 territory. In June of 2015 I was named Senior Vice President of Gas Opera-  
10 tions for NiSource and in May of 2016 I was named to my present position  
11 as Senior Vice President, Safety, Environmental and Training for NiSource.

12

13 **Q: Have you previously testified before any regulatory commissions?**

14 A: Yes, I testified before the Department of Public Utilities on behalf of Columbia  
15 Gas of Massachusetts ("CMA") in its base rate case proceeding D.P.U. 15-50.

16

17 **Q: What is the purpose of your testimony in this proceeding?**

18 A: The purpose of my testimony is to provide support for Columbia's implemen-  
19 tation of the American Petroleum Institute's ("API") recommended practice

1 1173 Safety Management Systems as it relates to Columbia’s related invest-  
2 ments in its Low Pressure Gas Distribution System Safety Enhancement Pro-  
3 gram (“LP Program”). The LP Program entails the installation of automatic  
4 shut-off valves and gas control room monitoring of our low pressure gas sys-  
5 tems.

6

7 **Q: What is the Pipeline Safety Management System (“SMS”)?**

8 A: In 2015, natural gas operators, industry representatives and state and fed-  
9 eral stakeholders collaborated to develop a comprehensive Pipeline Safety  
10 Management System known throughout the natural gas industry as a API  
11 Recommended Practice (or “RP”) 1173. RP 1173 establishes a set of stand-  
12 ards and best practices for the oil and natural gas industries based on the  
13 successful implementation of similar Safety Management Systems in the  
14 transportation, airline, and nuclear industries. RP-1173 provides guidance  
15 to pipeline operators for developing and maintaining a pipeline safety man-  
16 agement system. It is intended to augment existing practices while not du-  
17 plicating any other requirements. Columbia’s purpose for implementing  
18 SMS is to provide an objective framework to pursue a goal of zero incidents.

19

20 **Q: Is Columbia the only NiSource affiliate implementing SMS?**

1 A: No. NiSource became one of 12 companies to publicly commit to implement  
2 SMS by participating with the industry’s lead trade group, the American  
3 Gas Association, on a best-practice and information-sharing pilot group. In  
4 2016, Columbia Gas of Virginia became the first NiSource company to begin  
5 implementing SMS. NiSource is now accelerating implementation of SMS  
6 across its seven-state footprint with a focus on identifying and mitigating  
7 potential risks while continually assessing and improving processes and  
8 procedures to keep its employees, contractors, customers, and the public  
9 safe. SMS provides pipeline operators with an approach for rigorously  
10 identifying and managing risk, communicating with stakeholders, ensur-  
11 ing the effective operation of key processes, and promoting a learning en-  
12 vironment.

13 In 2018, NiSource adopted a staggered implementation plan for SMS  
14 across NiSource’s seven operating companies, including Columbia. Follow-  
15 ing a 2018 incident in Massachusetts, NiSource committed to accelerated  
16 implementation of SMS across all of its gas distribution companies.

17

18 **Q: What are NiSource’s goals for SMS?**

19 A: SMS is intended to do the following:

- 1 • Integrate the NiSource gas segment organization and connect safety man-  
2 agement across people, assets, and processes.
- 3 • Promote safety leadership and individual accountability for all employees,  
4 including front line, leadership, as well as for executives.
- 5 • Build on NiSource’s strong foundation of safety with a culture of transpar-  
6 ency and mutual trust, promoting an inclusive workplace, with a focus on  
7 continuous learning and improvement.
- 8 • Add rigor to work practices resulting in the identification and mitigation of  
9 risks to protect employees, contractors, customers and communities.

10

11 **Q: Please describe the critical tasks associated with SMS implementation.**

12 **A:** The most important steps NiSource is taking to implement SMS include the  
13 following:

- 14 • **Implementation of RP 1173 Requirements:** NiSource is assessing its cur-  
15 rent policies and procedures against the requirements of RP 1173 in order  
16 to ultimately align its policies and procedures with ten elements in RP 1173.

17 These 10 essential elements are:

- 18 1. Leadership and Management Commitment
- 19 2. Stakeholder Engagement
- 20 3. Risk Management

- 1                   4. Operational Controls
- 2                   5. Incident Investigation, Evaluation, and Lessons Learned
- 3                   6. Safety Assurance
- 4                   7. Management Review and Continuous Improvement
- 5                   8. Emergency Preparedness and Response
- 6                   9. Competence, Awareness, and Training
- 7                   10. Documentation and Recordkeeping

- 8       • **Development of a NiSource SMS Policy and Standard:** NiSource is estab-  
9       lishing a policy that governs SMS, and is developing a standard and process  
10       documentation that will serve as a guide for the execution and administra-  
11       tion of SMS.
- 12       • **Asset Assessment:** NiSource is assessing risk around its assets, including  
13       customer-owned assets, building probabilistic risk assessment models, as  
14       well as analyzing, prioritizing, and building corrective action programs for  
15       identified risks.
- 16       • **SMS State Risk Tables and SMS Deployment:** NiSource is establishing  
17       SMS State Risk Tables, chaired by the presidents and chief operating offic-  
18       ers and includes the top leaders in each state in which NiSource operates.  
19       The State Risk Table will assess identified risks, monitor SMS performance,

1 assign resources to support performance improvement, and take corrective  
2 actions.

3 • **Corrective Action Program (“CAP”):** NiSource is establishing a Corrective  
4 Action Program or CAP to identify risks and to take action to mitigate those  
5 risks. CAP will allow all employees and contractors to submit identified  
6 issues or concerns with physical assets, materials, resourcing, tools and  
7 equipment, work methods, and issues regarding health and safety.

8 • **Identification of Leadership Competencies to Support RP 1173 and Re-**  
9 **lated Assessments:** Leaders across the NiSource gas segment will be as-  
10 sessed based on the management and leadership requirements of RP 1173.  
11 These assessments will drive consistency in defining the behaviors,  
12 knowledge, and experiences needed to be successful in promoting the de-  
13 sired safety culture and identifying risks.

14 • **Conduct Safety Culture Assessments and Build Local Action Plans:**  
15 NiSource will conduct a safety culture assessment that is guided by compe-  
16 tencies that align to the management and leadership requirements set forth  
17 in RP 1173. The majority of areas across the NiSource footprint will partici-  
18 pate in the assessments and action planning through early 2020.



- 1 • **Emergency Preparedness and Response:** NiSource commissioned a cross-  
2 functional team to enhance emergency preparedness activities and emer-  
3 gency response capabilities. The team is integrating improved prepared-  
4 ness plans and drills covering a broad range of potential scenarios and lev-  
5 els of emergency, and establishing well-defined roles with clear responsi-  
6 bilities.
- 7 • **SMS Learning Map Experience:** The learning maps are tools to help em-  
8 ployees understand what they need to know about SMS. All 6,000 gas seg-  
9 ment employees will participate in hands-on learning activities between  
10 mid-2019 to early 2020 to help them understand SMS and its implementa-  
11 tion.

12 Finally, NiSource established a Quality Review Board, an independ-  
13 ent body that provides oversight and governance of NiSource’s implemen-  
14 tation of SMS across its seven-state footprint. Chaired by Former United  
15 States Secretary of Transportation Ray LaHood, the Quality Review Board  
16 is comprised of experts with diverse backgrounds spanning the nuclear,  
17 aviation, and energy industries.

18

1 **Q: How is SMS different than other pipeline safety programs and initiatives**  
2 **(DIMP, TIMP, Damage Prevention, Public Awareness, Infrastructures**  
3 **Modernization, etc.)?**

4 A: Our current pipeline safety programs and initiatives are a critical compo-  
5 nent of our pipeline safety improvement efforts and will be integrated into  
6 our safety management system approach. A fully deployed SMS will pro-  
7 vide an over-arching safety management approach that includes those cur-  
8 rent programs and initiatives. It may introduce additional programs as well  
9 a holistic risk view to better focus the efforts and investments of the current  
10 programs. It will serve to better integrate all pipeline safety initiatives  
11 across the organization by enhancing our risk prioritization and modeling,  
12 and strengthening and formalizing our continuous improvement pro-  
13 cesses.

14  
15 **Q: What work makes up Columbia's LP Program?**

16 A: The LP Program is comprised of several actions designed to improve safety  
17 on these gas systems. We completed a field survey of all of our low pressure  
18 systems and gas regulator stations in order to enhance our data, mapping,  
19 isometric drawings and GIS information. We have also evaluated our engi-  
20 neering designs in order to support both enhanced field practices as well as

1           asset modifications. We have implemented enhanced damage prevention  
2           practices to include additional station monitoring whenever excavation is  
3           occurring within proximity to regulator stations. We have also established  
4           enhanced work rules for tie-ins, construction involving system configura-  
5           tion changes, and any O&M work that involved excavation to include ad-  
6           ditional field monitoring of stations.

7                        To address the potential for human error in addition to our process  
8           and procedure improvements, we have developed designs to modify our  
9           low pressure systems to add an additional level of overpressure protection  
10          and redundancy such that they are equivalent to more modern elevated  
11          pressure systems. The work involves installing an automatic shut off device  
12          as the primary form of additional overpressure protection. This LP Program  
13          is further detailed in the testimony of Columbia witness Sullivan.

14

15   **Q:    What will be your standard going forward?**

16   A:    Going forward, our standard will be to install elevated pressure systems  
17          wherever possible. In the event that we have to add additional customers  
18          to a low pressure system we will ensure that that system and those custom-  
19          ers are protected by an additional level of overpressure protection. Our new

1 design standards for low pressure systems will exceed minimum compli-  
2 ance requirements by assuring that the third level of redundancy and over-  
3 pressure protection exists for our customers.

4

5 **Q: What is the scope of work for Columbia?**

6 A: Columbia has 52 low pressure gas delivery systems, 515 miles of low pres-  
7 sure main serving approximately 40,000 customers. In these systems there  
8 are 204 regulator stations that will be retrofitted or rebuilt as part of the low  
9 pressure project to install automatic shut off valves and monitoring capa-  
10 bilities (a low pressure gas system may have one or several regulator sta-  
11 tions feeding the system). More specifics are provided in the testimony of  
12 Columbia witness Sullivan.

13

14 **Q: When will Columbia complete the installation of automatic shut off de-**  
15 **vices?**

16 A: We are estimating that the installation of automatic shut off devices will be  
17 completed by the third quarter of 2020 or sooner. Additional work may  
18 stretch into 2021. Please note that, as this work involves regulator station  
19 configuration control, we have reinforced the existing stop-work authority

1 to all work crews to emphasize that continued safe operation and installa-  
2 tion is the priority, and we will not introduce time pressure into the field-  
3 level work tasks. We also plan to reduce field installations during the heat-  
4 ing season, our time of highest gas use, to reduce risk and assure we main-  
5 tain gas service reliably to customers throughout the winter. Therefore, the  
6 ultimate schedule and time line will be dictated by the ability to safely com-  
7 plete the work.

8

9 **Q: Does this complete your prepared direct testimony?**

10 **A:** Yes, it does but I reserve the right to supplement my testimony.

COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION

In the matter of:

THE ELECTRONIC APPLICATION OF COLUMBIA GAS OF )  
KENTUCKY, INC. FOR: 1) A DECLARATION THAT )  
CONSTRUCTION OF A LOW PRESSURE SYSTEM SAFETY )  
IMPROVEMENT IS AN EXTENSION OF ITS SYSTEM IN THE )  
ORDINARY COURSE OF BUSINESS; 2) IN THE ALTERNATIVE,)  
FOR THE ISSUANCE OF A CERTIFICATE OF PUBLIC )  
CONVENIENCE AND NECESSITY FOR SUCH )  
CONSTRUCTION; 3) APPROVAL OF AN AMENDMENT AND )  
EXPANSION OF ITS ACCELERATED MAIN REPLACEMENT )  
TARIFF TO AN ACCELERATED SAFETY AND )  
REPLACEMENTTARIFF; AND (4) APPROVAL TO MODIFY )  
THE 2019 AMRP CONSTRUCTION PLAN )

Case No. 2019-00257

CERTIFICATE AND AFFIDAVIT

The Affiant, David A. Monte, being duly sworn, deposes and states that the prepared testimony attached hereto and made a part hereof, constitutes the prepared direct testimony of this affiant in the above-captioned matter, and that if asked the questions propounded therein, this affiant would make the answers set forth in the attached prepared direct pre-filed testimony.

  
David A. Monte

STATE OF OHIO

COUNTY OF FRANKLIN

SUBSCRIBED AND SWORN to before me by David A. Monte on this the 25<sup>th</sup>  
day of July, 2019.

April A. Lester  
Notary Public

My Commission expires: 07-08-2020



April A. Lester  
Notary Public, State of Ohio  
My Commission Expires 07-08-2020

Exhibit 5

Testimony of Judy Cooper



**COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION**

In the matter of: )  
)  
THE ELECTRONIC APPLICATION OF COLUMBIA GAS )  
OF KENTUCKY, INC. FOR: 1) A DECLARATION THAT )  
CONSTRUCTION OF A LOW PRESSURE SYSTEM )  
SAFETY IMPROVEMENT IS AN EXTENSION OF ITS )  
SYSTEM IN THE ORDINARY COURSE OF BUSINESS; 2) )  
IN THE ALTERNATIVE, FOR THE ISSUANCE OF A )  
CERTIFICATE OF PUBLIC CONVENIENCE AND NE- )  
CESSITY FOR SUCH CONSTRUCTION; 3) APPROVAL )  
OF AN AMENDMENT AND EXPANSION OF ITS AC- )  
CELERATED MAIN REPLACEMENT TARIFF TO ITS )  
SAFETY MODIFICATION AND REPLACEMENT TAR- )  
IFF; AND (4) APPROVAL TO MODIFY THE 2019 AMRP )  
CONSTRUCTION PLAN )

Case No. 2019-00257

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**PREPARED DIRECT TESTIMONY OF  
JUDY M. COOPER  
ON BEHALF OF COLUMBIA GAS OF KENTUCKY, INC.**

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**July 29, 2019**

Attorneys for Applicant  
**COLUMBIA GAS OF KENTUCKY, INC.**

**PREPARED DIRECT TESTIMONY OF JUDY M. COOPER**

1 **Q: Please state your name and business address.**

2 A: My name is Judy M. Cooper and my business address is Columbia Gas of  
3 Kentucky, Inc., 2001 Mercer Road, Lexington, Kentucky, 40511.

4

5 **Q: What is your current position and what are your responsibilities?**

6 A: I am the Director of Government and Regulatory Affairs for Columbia Gas  
7 of Kentucky, Inc. ("Columbia"). I am responsible for the management of  
8 Columbia's regulatory policy, tariffs and filings with the Commission. I  
9 am also responsible for Columbia's local government and state govern-  
10 ment affairs including franchises, and monitoring legislation.

11

12 **Q: What is your educational background?**

13 A. I am a graduate of the University of Kentucky where I received a Bachelor  
14 of Science Degree in Accounting in 1982. I also received a Master in  
15 Business Administration from Xavier University in 1985.

16

17 **Q: What is your employment history?**

18 A: I was employed by the Kentucky Public Service Commission ("Commis-  
19 sion") as an auditor in 1982. Subsequently, I served as Rate Analyst, Ener-

1           gy Policy Advisor, Branch Manager of Electric and Gas Rate Design, and  
2           Director of Rates, Tariffs and Financial Analysis at the Commission. In Ju-  
3           ly of 1998 I joined Columbia as Manager of Regulatory Services. My job ti-  
4           tle has since been revised and expanded to that of Director, Government  
5           and Regulatory Affairs.

6

7   **Q.   Have you previously testified before the Kentucky Public Service**  
8   **Commission?**

9   A:   Yes, I have testified before the Kentucky Public Service Commission in  
10   five cases for Columbia: Case No. 2002-00117, “The Filing by Columbia  
11   Gas of Kentucky, Inc. to Require that Marketers in the Small Volume Gas  
12   Transportation Program be Required to Accept a Mandatory Assignment  
13   of Capacity”;; Case No. 2007-00008, “In the Matter of Adjustment of Rates  
14   of Columbia Gas of Kentucky, Inc.”; Case No. 2009-00141, “In the Matter  
15   of an Adjustment of Rates of Columbia Gas of Kentucky, Inc.”; Case No.  
16   2010-00146, “An Investigation of Natural Gas Retail Competition Pro-  
17   grams”; Case No. 2013-00167, “ In the Matter of Application of Columbia  
18   Gas of Kentucky, Inc. for an Adjustment of Rates for Gas Service”; and  
19   Case No. 2016-00162, “In the Matter of Application of Columbia Gas of  
20   Kentucky, Inc. for an Adjustment of Rates”.

1 **Q: What is the purpose of your testimony in this proceeding?**

2 A: The purpose of my testimony is to support the proposed modification to  
3 Columbia's Accelerated Main Replacement Program ("AMRP") Rider  
4 ("Tariff AMRP") to be renamed the Safety Modification and Replacement  
5 Program ("SMRP") Rider ("Tariff SMRP"). I will address the funding of  
6 the cost of the Low Pressure Gas Distribution System Safety Enhancement  
7 Program ("LP Program") that is detailed in the testimony of Columbia's  
8 witness Mr. Sullivan, and how Columbia proposes to adjust its revenue to  
9 recover this cost under the Tariff SMRP. The new and marked-up revised  
10 proposed tariff sheets are attached as Exhibit 1 to the Application.

11

12 **Q: Why is Columbia proposing to change the name of its Tariff AMRP to**  
13 **Tariff SMRP?**

14 A: The change is proposed to more accurately reflect the purpose of the rider.  
15 In 2008, Columbia began a planned systematic replacement of certain  
16 types of gas main and services through continuous evaluation, planning  
17 and prioritization of replacements in order to provide safe, reliable deliv-  
18 ery of gas service.<sup>1</sup> The program was focused on the combined effects of  
19 aging pipe and continuous corrosion creating an increased risk to public

---

<sup>1</sup> Direct Testimony of David E. Mueller, page 8, Case No. 2009-00141

1 safety. The program designed to address this increased risk was given the  
2 name because it planned for the more aggressive replacement of mains  
3 and services than in the past. The program specifically targeted unprotect-  
4 ed bare steel, cathodically protected bare steel, cathodically un-protected  
5 coated steel, ineffectively coated steel and cast iron mains as priority pipe.  
6 It also included replacement of metallic service lines, service lines not  
7 meeting current material and construction standards and associated ap-  
8 purtenances. A similar initiative had been implemented by The Union  
9 Light, Heat and Power Company in Case No. 2001-00092.

10 As a prudent operator, Columbia must be proactive in identifying  
11 and addressing issues that could have significant impacts upon safety and  
12 reliability. That is why Columbia implemented Tariff AMRP. Looking  
13 back, Columbia could have chosen the name "Tariff SMRP" at the begin-  
14 ning because the program was, and is, about safety and modernization of  
15 Columbia's system for the benefit of customers, employees and the gen-  
16 eral public.

17

18 **Q: How do the terms and operation of Columbia's proposed Tariff SMRP**  
19 **differ from its existing Tariff AMRP?**

1 A: Columbia does not propose any changes to the terms of Tariff SMRP that  
2 would make it differ from the operation of Tariff AMRP. As is the current  
3 procedure, Columbia will continue to submit the projected program costs  
4 for the planned work in the upcoming calendar year. Following the com-  
5 pletion of a construction year, a balancing adjustment to true-up the actual  
6 costs with the projected costs for the same period will be filed just as is  
7 currently done.

8

9 **Q: What is different about Tariff SMRP as compared to Tariff AMRP?**

10 A: The difference is simply a name that more broadly characterizes the pro-  
11 jects that are approved by the Commission for recovery under the tariffed  
12 rider.

13

14 **Q: What project work has Columbia requested be approved under Tariff**  
15 **AMRP?**

16 A: Columbia's previously filed planned AMRP work has been limited entire-  
17 ly to replacement of pipeline main, services and facilities associated with  
18 the targeted priority pipe as described in the testimony of Columbia wit-  
19 ness Mueller in Case No. 2009-00141. However, aging pipelines and corro-  
20 sion are not the only risks that dictate the replacement of natural gas pipe-

1 line assets. As a prudent operator, Columbia is committed to the ongoing  
2 evaluation, prioritization and investment in its facilities to provide safe  
3 and reliable delivery of natural gas service. The LP Program, described by  
4 Columbia's witnesses Monte and Sullivan, is a result of this evaluation  
5 and prioritization. Its purpose is public safety, the same purpose as the  
6 replacement of priority pipe. Columbia is requesting authority to amend  
7 its 2019 AMRP Construction Plan to include the LP Program. It is appro-  
8 priate to change the name to reflect the broader scope of projects that are  
9 reviewed by the Commission, approved and included as a priority for  
10 safety and reliability issues that are not already recovered in base rates.

11

12 **Q: Has the Commission allowed inclusion of similar projects and cost re-**  
13 **covery under riders and mechanisms for other natural gas utilities?**

14 A: Yes. The Commission has allowed inclusion of a variety of risk reduction  
15 projects and associated cost recovery under similar tariff provisions of  
16 Atmos Energy Corporation ("Atmos"), Delta Natural Gas Company, Inc.  
17 ("Delta"), Louisville Gas and Electric Company ("LG&E"), and formerly  
18 The Union Light, Heat and Power Company now Duke Energy Kentucky,  
19 Inc. ("ULH&P" or "Duke").



1           For years, the Commission has reviewed, approved, and successful-  
2 ly monitored projects that included replacement of similar priority pipe to  
3 that of Columbia as well as other more modern materials. Other compa-  
4 nies have sometimes included projects, unique to the risk evaluation and  
5 prioritization of each individual company that have been separately re-  
6 viewed, scrutinized and authorized by the Commission for inclusion un-  
7 der the similar riders and tariff mechanisms of the respective individual  
8 companies. Examples include: LG&E's recently approved inclusion of  
9 Transmission Modernization and Steel Service Line Replacement Pro-  
10 grams in its Gas Line Tracker ("GLT") Rider; Duke's transition of its  
11 AMRP to an Accelerated Service Line Replacement Program; and Atmos's  
12 use of its Pipeline Replacement Program to replace a non-cast iron or bare  
13 steel line in Shelby County.

14

15 **Q: What other changes does Columbia propose to its Tariff AMRP set forth**  
16 **on Tariff Sheet No. 58?**

17 **A:** Except for the text change to rename as Tariff SMRP, no other changes to  
18 the Tariff Sheet No. 58 are proposed.

19

20 **Q: What are the proposed rates for Tariff SMRP?**

1 A: The rates for Tariff SMRP will remain the same as those currently in effect  
2 for Tariff AMRP. No change in rates to customers is proposed at this time.

3

4 **Q: How does Columbia propose to address subsequent revisions to Tariff**  
5 **SMRP charges?**

6 A: In March 2020, when Columbia files its Balancing Adjustment pursuant to  
7 Tariff Sheet No. 58, Columbia proposes to include the actual costs in-  
8 curred in 2019 for the LP Program along with the reconciliation of fore-  
9 casted to actual cost of its previously authorized pipeline replacement  
10 projects that were forecasted and authorized in Case No. 2018-00354. The  
11 revised rate would be effective with June 2020 Unit 1 billing, pursuant to  
12 Tariff Sheet No. 58.

13 In October 2019, Columbia proposes to include the forecasted LP  
14 Program costs for calendar year 2020 with its otherwise eligible planned,  
15 pipeline replacement projects. As in previous years, and pursuant to Tariff  
16 Sheet No. 58, the proposed rates would become effective with January  
17 2020 Unit 1 billing.

18

19 **Q: How does Columbia plan to finance the LP Program construction?**

1 A: The LP Program work is funded through internally available funds and/or  
2 debt issuances previously approved by the Commission. No additional fi-  
3 nancing is planned at this time.

4

5 **Q: Does this complete your Prepared Direct testimony?**

6 A: Yes, however, I reserve the right to file rebuttal testimony if necessary.

**COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION**

In the matter of:

THE ELECTRONIC APPLICATION OF COLUMBIA GAS OF  
KENTUCKY, INC. FOR: 1) A DECLARATION THAT  
CONSTRUCTION OF A LOW PRESSURE SYSTEM SAFETY  
IMPROVEMENT IS AN EXTENSION OF ITS SYSTEM IN THE  
ORDINARY COURSE OF BUSINESS; 2) IN THE  
ALTERNATIVE, FOR THE ISSUANCE OF A CERTIFICATE  
OF PUBLIC CONVENIENCE AND NECESSITY FOR SUCH  
CONSTRUCTION; 3) APPROVAL OF AN AMENDMENT AND  
EXPANSION OF ITS ACCELERATED MAIN REPLACEMENT  
TARIFF TO AN ACCELERATED SAFETY AND  
REPLACEMENT TARIFF; AND (4) APPROVAL TO MODIFY  
THE 2019 AMRP CONSTRUCTION PLAN

Case No. 2019-00257

CERTIFICATE AND AFFIDAVIT

The Affiant, Judy M. Cooper, being duly sworn, deposes and states that the prepared testimony attached hereto and made a part hereof, constitutes the prepared direct testimony of this affiant in the above-captioned matter, and that if asked the questions propounded therein, this affiant would make the answers set forth in the attached prepared direct pre-filed testimony.

  
\_\_\_\_\_  
Judy M. Cooper

COMMONWEALTH OF KENTUCKY

COUNTY OF FAYETTE

SUBSCRIBED AND SWORN to before me by Judy M. Cooper on this the 26<sup>th</sup>  
day of July, 2019.

Evelyn Long Dur  
Notary Public

My Commission expires: 5/15/2022

Exhibit 6

Testimony of Gary Sullivan

**COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION**

In the matter of: )  
 )  
 THE ELECTRONIC APPLICATION OF COLUMBIA )  
 GAS OF KENTUCKY, INC. FOR: 1) A DECLARATION )  
 THAT CONSTRUCTION OF A LOW PRESSURE SYS- )  
 TEM SAFETY IMPROVEMENT IS AN EXTENSION OF )  
 ITS SYSTEM IN THE ORDINARY COURSE OF BUSI- ) Case No. 2019-00257  
 NESS; 2) IN THE ALTERNATIVE, FOR THE ISSU- )  
 ANCE OF A CERTIFICATE OF PUBLIC CONVEN- )  
 IENCE AND NECESSITY FOR SUCH CONSTRUC- )  
 TION; 3) APPROVAL OF AN AMENDMENT AND EX- )  
 PANSION OF ITS ACCELERATED MAIN REPLACE- )  
 MENT TARIFF TO ITS SAFETY MODIFICATION AND )  
 REPLACEMENT TARIFF; AND (4) APPROVAL TO )  
 MODIFY THE 2019 AMRP CONSTRUCTION PLAN )

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**PREPARED DIRECT TESTIMONY OF  
GARY E. SULLIVAN  
ON BEHALF OF COLUMBIA GAS OF KENTUCKY, INC.**

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**July 29, 2019**

Attorneys for  
**COLUMBIA GAS OF KENTUCKY, INC.**



PREPARED DIRECT TESTIMONY OF GARY E. SULLIVAN

1 I. INTRODUCTION

2 Q: Please state your name and business address.

3 A: My name is Gary Sullivan and my business address is 2001 Mercer Rd., Lexington,  
4 Kentucky, 40511.

5

6 Q: What is your current position and what are your responsibilities?

7 A: I am the Manager of Field Engineering for Columbia Gas of Kentucky (“Colum-  
8 bia”). Columbia is part of the NiSource Inc. (“NiSource”) family of companies. My  
9 responsibilities include ensuring the Columbia engineering team’s designs, job or-  
10 ders and job order drawings are technically accurate, safe and comply with state  
11 and federal code, and with NiSource’s gas standards. I am also responsible for  
12 ensuring that the materials selected are appropriate for each capital job order and  
13 are commensurate with the maximum allowable operating pressure (“MAOP”) of  
14 the system on which Columbia is working. In addition, I review proposed tie-in  
15 plans and pressure testing plans of many complex projects to ensure they are  
16 workable and appropriate. I am also responsible for executing Columbia’s capital  
17 plan as well as monitoring, controlling and reporting variances to the budget clas-  
18 ses of the capital plan and at the project level as well. My responsibilities also in-  
19 clude ensuring that the engineering team receives the training and development

1 needed to remain current in the industry and to continue providing safe designs  
2 for our customers. I provide oversight to the engineers, engineering technician,  
3 and interns on the team who are also responsible for winter operations planning  
4 and providing emergency support to field personnel. The engineering team and I  
5 collaborate with other Columbia departments to ensure safe, efficient and cost ef-  
6 fective capital designs are developed, communicated and constructed.

7  
8 **Q: What is your educational background?**

9 A: I attended the A. James Clark College of Engineering at the University of Maryland  
10 in College Park, graduating with a Bachelor of Science degree in Mechanical Engi-  
11 neering in 1996.

12  
13 **Q: What professional licenses do you hold?**

14 A: I am a licensed professional engineer in the Commonwealth of Kentucky and have  
15 been since 2003.

16  
17 **Q: Please describe your professional employment history.**

18 A: In 1996, I joined Forensic and Research Engineers, Inc. located in College Park,  
19 Maryland as a Project Manager/Principle Investigator performing a Small Business  
20 Innovation Research project where the company designed, constructed and tested

1 a high-speed composite flywheel intended for use in low earth orbit satellites.  
2 Other responsibilities included accident reconstruction, patent claim interpreta-  
3 tion and investigation of product liability claims for clients. In 1998, I joined Co-  
4 lumbia as an Operations Engineer supporting the Ashland, Prestonsburg,  
5 Maysville and Winchester Operating Areas. After a departmental restructuring, I  
6 was assigned as the operations engineer for the entire state as part of the Capital  
7 Design team where the team performed all the capital design tasks from project  
8 inception to close-out. In 2007 I was awarded the Leader of Field Engineering po-  
9 sition where I was responsible for leading the engineering team in the design of  
10 capital projects, technical and emergency support to field operations, and winter  
11 operations planning in addition to monitoring and reporting the capital costs. In  
12 2016, I was awarded the Manager, Field Engineering position where I continued  
13 leading the Kentucky engineering team, but took on additional responsibilities for  
14 capital planning and management, project identification and selection, and sup-  
15 port for additional stakeholders.

16  
17 **Q: Have you previously testified before any regulatory Commissions?**

18 **A:** Yes. I have provided written testimony to this Commission in an application for  
19 Deviation from the Rules in 2015, Case No. 2015-00084.

20

1 **II. PURPOSE OF TESTIMONY**

2 **Q: What is the purpose of your testimony in this proceeding?**

3 A: I will provide a general overview of Columbia’s operating territory and gas distri-  
4 bution system, and how Columbia’s low pressure (“LP”) distribution facilities in-  
5 tegrate with the natural gas delivery to the customers served from low pressure  
6 systems. Also, I will be providing testimony in support of the NiSource Low Pres-  
7 sure Gas Distribution System Safety Enhancement Program (“LP Program”) and  
8 the Pipeline Safety Management System (“SMS”).

9

10 **III. OVERVIEW OF COLUMBIA’S OPERATING TERRITORY AND GAS DISTRI-  
11 BUTION SYSTEM**

12 **Q: What geographic area does Columbia serve?**

13 A: Columbia’s service territory is spread across the central, north central and eastern  
14 parts of Kentucky. Columbia serves customers in and around the cities of Frank-  
15 fort, Versailles, Midway, Lexington, Georgetown, Cynthiana, Paris, Winchester,  
16 Mt. Sterling, Irvine and Richmond. Columbia also serves customers in Maysville,  
17 Ashland and several communities along the Ohio and Big Sandy Rivers from  
18 South Shore to Louisa. In south eastern Kentucky, Columbia serves several smaller  
19 towns and communities such as Beauty, Lovely, South Williamson, Betsey Layne,  
20 Inez, Warfield, Pippa Passes, Lancer, Drift, Hindman and Harold.

1 **Q: What role does Columbia serve in delivering gas to its end use customers?**

2 A: Columbia receives the natural gas commodity at city gate stations where the trans-  
3 mission pressure of the gas is reduced to local distribution levels. An odorant  
4 known as mercaptan is typically added to the natural gas at the city gate giving  
5 the gas its distinctive odor. The gas continues through the distribution system  
6 where additional pressure reduction occurs at district stations, pressure control-  
7 ling stations downstream of city gate stations, where the pressure is systematically  
8 reduced to levels commensurate with the piping system's maximum allowable op-  
9 erating pressure ("MAOP"). Each district station is designed with one or more  
10 runs of pressure controlling regulators and over-pressure protective devices. The  
11 pressure set point at these stations is set consistent with the MAOP and taking into  
12 account for possible creep, a pressure increase due to an inability of a regulator to  
13 perfectly hold set point. Customers served from systems operating at elevated  
14 pressure, pressure greater than 1 psig, have service regulators that provide the last  
15 measure of Columbia-operated over-pressure protection. In contrast, customers  
16 served from systems operating at less than 1 psig require no service regulator and  
17 their overpressure protection is controlled at Columbia's district station. In sum,  
18 Columbia's distribution system moves relatively small volumes of natural gas at  
19 increasingly lower pressures over relatively shorter distances to a far greater num-  
20 ber of individual consumers than our interstate pipeline counterparts.

1 **Q: Provide a brief overview of Columbia’s low pressure network.**

2 A: Columbia currently operates 515 miles of low pressure pipe in 16 counties and 23  
3 municipalities. In addition, Columbia started 2019 with 204 district stations that  
4 control pressure within its low pressure systems.

5

6 **IV. HISTORICAL PRESSURE CONTROL PRACTICES**

7 **Q: Please describe Columbia’s current pressure control practices?**

8 A: Because a premium has always been placed on continuity of service, the industry  
9 has generally utilized fail-open pressure control equipment. Fail-open equipment  
10 refers to equipment that responds to a low pressure signal at the outlet of the sta-  
11 tion by opening an internal valve that allows more gas into the downstream sys-  
12 tem trying to match downstream demand. In order to prevent an overpressure  
13 event with this type of equipment, Title 49 CFR Part 192 (“Code”) requires that an  
14 overpressure protective device be installed to activate so that a single event cannot  
15 cause the simultaneous failure of both the primary regulator controlling the pres-  
16 sure (“control regulator”) and the overpressure protective device. The Code al-  
17 lows the operator to choose the manner in which overpressure protection is ac-  
18 complished. Columbia utilizes four general control configurations at district sta-  
19 tions to achieve overpressure protection for its customers: wide-open moni-  
20 tor/control regulator, working monitor/control regulator, wide-open monitor/

1 control regulator/secondary relief valve, and control regulator/primary relief  
2 valve.

3

4 **Q: Pressure control is obviously very important in natural gas distribution systems;**  
5 **please describe that in more detail.**

6 A: Many different pressures are needed in natural gas distribution systems to meet  
7 the requirements of our customers. For example, the inlet pressure at a point of  
8 delivery station could exceed 1000 psig and must be reduced to a level suitable for  
9 the distribution company. However, a typical residential customer needs only  
10 about 7 inches of water column (“w.c.”) at the outlet of their meter. Given these  
11 types of extremes it is evident that some form of pressure control is needed.

12 A pressure regulator is an automatic, self-contained, proportional controller.  
13 It is designed to reduce a higher pressure to a lower pressure by controlling the  
14 gas flow through a self-contained valve. Regulators consist of three basic elements:  
15 a restricting element, a measuring element, and a loading element. The restricting  
16 element is the aforementioned valve. It either opens or closes based on some type  
17 of pneumatic feedback signal representative of demand and pressure. The meas-  
18 uring element measures the downstream pressure and compares it with the de-  
19 sired pressure to determine if a change in flow is necessary. In general, the meas-  
20 uring element responds to a change in pressure through a feedback signal to the

1 underside of the diaphragm to counteract the spring pressure from above. This  
2 feedback occurs either through control lines or internal cavities in the regulator.  
3 The opposing forces between the spring and diaphragm causes the valve to open  
4 more to provide more gas or close to provide less gas. The loading element or  
5 spring exerts a compressive force acting downward against the diaphragm having  
6 pressure on it and opposing that force.

7  
8 **Q: What is Columbia's most frequently used over-pressure protection arrangement**  
9 **for district stations?**

10 **A:** The most frequently utilized control configuration is a wide-open monitor and  
11 control regulator arrangement where the control regulator normally controls the  
12 pressure into a natural gas system at a pressure less than the MAOP. Both the  
13 monitor and control regulators usually have sensing lines ("control lines") that  
14 continuously sense the downstream pressure. A valve inside the regulator reacts  
15 to changes in the downstream pressure by opening and closing to supply the  
16 downstream demand for gas at the appropriate pressure. If the control regulator  
17 quits reacting to an increase in the downstream pressure, the wide-open monitor  
18 regulator will sense that condition at a pre-determined pressure and begin con-  
19 trolling the pressure to the system thus avoiding an overpressure event. The set  
20 pressure to the monitor is set such that its valve is normally wide-open and in a



1 passive mode unless and until it begins sensing an abnormal elevated pressure  
2 where it starts controlling. The station would continue operating in this manner  
3 until the control regulator is repaired.

4  
5 **Q: What are the other methods Columbia uses for over-pressure protection for dis-**  
6 **trict stations?**

7 A: A variation to the previously mentioned design is a working monitor/control reg-  
8 ulator arrangement. In contrast to the previous design, the monitor lowers the  
9 pressure by an intermediate amount with the final pressure reduction still occur-  
10 ring with the control regulator. Instead of being a passive device that only operates  
11 when there is an abnormal operating condition, the working monitor operates as  
12 long as there is gas demand. This design also utilizes control lines to sense the  
13 downstream pressure and reacts in precisely the same manner as the control line  
14 of a wide-open monitor. On natural gas systems having fewer than 100 customers,  
15 Columbia adds a secondary relief valve to the downstream system to minimize  
16 the risk of over pressuring a system due to minor by-pass valve leak through.  
17 However, these valves are not designed to provide full capacity relief. They may  
18 be added to either of the two previous designs discussed if the system is small or  
19 the pressure differential across the regulator is large. Columbia's last design meth-  
20 odology utilizes a pressure control arrangement where a single regulator controls

1 the downstream pressure and the overpressure protection is achieved through a  
2 primary relief valve designed to exhaust sufficient quantities of gas to the atmos-  
3 phere so a downstream overpressure event is avoided when a potential overpres-  
4 sure situation is sensed.

5  
6 **Q: Are there any guidelines Columbia uses as reference for operating and main-  
7 taining district stations?**

8 A: Yes. Columbia has written O&M plans that conform to federal safety requirements  
9 specified in Title 49 CFR Part 192.

10  
11 **Q: Does Columbia currently meet federal requirements for operating its pressure  
12 control stations including its LP stations?**

13 A: Yes. Columbia performs safety related inspections and tests of its facilities accord-  
14 ing to Code. In particular, DOT Part 192.739 requires operators to conduct inspec-  
15 tions to ensure that all the equipment is in good mechanical condition, adequate  
16 from the standpoint of capacity and reliability of operation, set to control or relieve  
17 at the correct pressure, and be properly installed and protected from dirt and liq-  
18 uids or other contaminants. These inspections are required at intervals not exceed-  
19 ing 15 months, but at least once each calendar year. Additionally, if primary relief  
20 devices are used, a calculation is performed by the engineering team at intervals

1 not to exceed 15 months, but at least once each calendar year verifying the device  
2 has the capacity to limit any potential overpressure in the pipeline to allowable  
3 levels.

4  
5 **Q: Are there any other safety standards that are followed?**

6 A: Yes. The NiSource Gas Standards team is responsible for monitoring activities at  
7 the Pipeline and Hazardous Materials Safety Administration (“PHMSA”) looking  
8 for upcoming rule changes. In addition, it monitors industry best practices from  
9 operators all across the United States and from time to time will issue safety rec-  
10 ommendations in the form of Operational Notices that will be passed to the nec-  
11 essary stakeholders for implementation.

12  
13 **Q: Please describe what is unique about a low pressure system.**

14 A: Practically all of Columbia’s customers supplied from an elevated pressure sys-  
15 tem, system operating above one psig, have a service regulator in proximity to  
16 their meter at their home or business that is designed to control the pressure to a  
17 level suitable for their appliances. In contrast, pressure control for low pressure  
18 customers supplied from an LP system occurs at the district station itself. CFR Part  
19 192.623 requires the following of low pressure distribution systems: (a) no person  
20 may operate a low pressure distribution system at a pressure high enough to make

1 unsafe the operation of any connected and properly adjusted low pressure gas  
2 burning equipment, and (b) no person may operate a low pressure distribution  
3 system at a pressure *lower* than the minimum pressure at which the safe and con-  
4 tinued operation of any connected and properly adjusted low pressure equipment  
5 can be assured. Columbia generally operates low pressure systems between 10 and  
6 12 inches w.c. to meet those two requirements in addition to the 7 inches w.c. min-  
7 imum delivery pressure that is required by Columbia's tariff.

8  
9 **Q: Please describe what is meant by inches of water column?**

10 **A:** Inches of water column is a unit of pressure that is often used to describe the pres-  
11 sure in low pressure systems. It is the pressure exerted by a column of water one  
12 inch in height. Low pressure systems typically operate somewhere less than 14  
13 inches of w.c. which equates to about ½ psig.

14  
15 **V. LOW PRESSURE GAS DISTRIBUTION SYSTEM SAFETY ENHANCEMENT**  
16 **PROGRAM**

17 **Q: Provide a brief overview of Columbia's LP Program.**

18 **A:** Columbia's first element of the LP Program was to conduct a field review of all of  
19 our low pressure district stations. This included vacuum excavations to enhance  
20 our knowledge of our underground control lines and update mapping, isometric

1 sketches and GIS information. Columbia also conducted an engineering design  
2 evaluation in order to support enhanced field practices as well as asset modifica-  
3 tions. Secondly, we implemented enhanced damage prevention practices by  
4 providing additional on-site station monitoring when excavation was planned to  
5 occur within specified distances of affected low pressure stations. Columbia also  
6 enhanced work rules for tie-ins necessary during construction or maintenance ac-  
7 tivities in low pressure systems that also included station monitoring.

8 The capital investments associated with the LP Program are to be made in  
9 two phases. Phase I of the capital investments began in April of 2019 and includes  
10 installing automatic shut-off valves (“ASV”) as the primary form of overpressure  
11 protection in our low pressure systems. Also, on two small systems, we will be  
12 installing low pressure gas regulators on facilities supplying those customers that  
13 perform the same function as the overpressure equipment at the district station.  
14 We will also be installing electronic instrumentation at each district LP station that  
15 can inform NiSource’s Gas Control should one of these ASVs activate as well as  
16 sense other abnormal operating conditions. Columbia estimates that Phase I of the  
17 capital investments will require \$11,152,514.

18 Attachment A provides the estimated cost detail of Phase I of the project by  
19 work packages. Work Package I represents the exchange of an existing regulator  
20 with an ASV whether it be by simple exchange of components or modifications of

1 piping to accommodate space limitations or the addition of strainers or smaller  
2 sized regulators. Work Package I is currently underway. Work Package II repre-  
3 sents the installation of electronic monitoring devices at each *station* where  
4 NiSource Gas Control can monitor alerts and receive once a day polling. Work  
5 Package III represents the installation of non-primary relief valves, and Work  
6 Package IV represents the installation of electronic monitoring devices on each low  
7 pressure system where NiSource Gas Control can monitor in real time.

8 A second phase of the program is being contemplated. This phase would  
9 eliminate the station by-pass valves altogether. By-pass valves are a station valve  
10 that separates the elevated pressure inlet system from the low pressure outlet sys-  
11 tem. They are normally manually operated by one technician during maintenance  
12 operations to supply downstream customers while another technician performs  
13 work on the control regulators. They are also available for use to supply down-  
14 stream customers during abnormal operating conditions. By-pass valves pose po-  
15 tential risks of overpressure by leak through or incorrect operation. However, the  
16 risk of overpressure due to by-passes will be assessed and compared with other  
17 system risks and prioritized accordingly.

18  
19 **Q: Please provide the locations of the low pressure stations and a detail of the work**  
20 **being performed.**

1 A: Please see Attachments B and C provided with this testimony. Attachment B identifies the LP station by name and city. It also identifies the project ID, the selected regulator solution, the type of station telemetry, and the actual costs to date. Attachment C contains the station design drawings that correlate to the pressure control solution selected that is identified in Column E of Attachment B.

6  
7 **Q: Why has Columbia initiated Phase I of the capital investments at this time?**

8 A: Columbia's actions result from a 2018 incident that occurred with an affiliate in Massachusetts that involved an overpressure event. Columbia believes the added overpressure protection proposed is consistent with and in the spirit of continuously assessing and implementing measures intended to reduce risks as required by the Gas Distribution Pipeline Integrity Management elements described in Subpart P of 49 CFR Part 192 and Part 192.1007 (5)(d) in particular.

14  
15 **Q: Can you describe how this automatic shut-off valve functions?**

16 A: The automatic shut-off valve is designed to fulfill both the maximum and minimum allowable operating pressure requirements of Part 192.623 that was discussed in Section IV of my testimony. If it is placed in the monitor mode, it functions as an ordinary monitor regulator that begins controlling pressure when it senses the control regulator is no longer responding to increases in downstream

1 pressure. The shut-off valve also introduces a different mode of failure over tradi-  
2 tional overpressure protection. If for some reason the downstream pressure con-  
3 tinues to rise to levels that could be hazardous to customers, the regulator's valve  
4 closes immediately stopping the flow of gas and requires trained technicians to  
5 diagnose and correct the pressure control problem. Additionally, if the regulator  
6 senses a downstream pressure that is too low for continued safe operation, the  
7 regulator's valve also immediately closes and will not re-open until trained tech-  
8 nicians diagnose and correct that problem as well.

9  
10 **Q: Will the LP Program create a wasteful duplication of plant, equipment, prop-**  
11 **erty, or facilities?**

12 **A:** No. For the majority of the stations, this work will simply be the exchange of one  
13 style of pressure control equipment with another that has a different mode of fail-  
14 ure. Title 49 CFR Part 192.195(b) requires that each distribution system that is sup-  
15 plied from a source of gas that is at a higher pressure than the MAOP for the sys-  
16 tem must

- 17 (1) Have pressure regulation devices capable of meeting the pres-  
18 sure, load, and other service conditions that will be experienced  
19 in normal operation of the system, and that could be activated in  
20 the event of failure of some portion of the system; and



1 (2) Be designed to prevent accidental overpressuring.

2 As discussed in Section III of my testimony, the majority of Columbia's cur-  
3 rent designs accomplish the overpressure protection requirements of Part 192.195  
4 utilizing some form of monitor/control arrangement in series. The proposed de-  
5 sign only replaces one of these regulators in most cases with an improved control  
6 arrangement designed to better prevent accidental overpressuring. However,  
7 there are some instances where both regulators are being replaced due to the spe-  
8 cifics of the existing pressure control arrangement. Even though there are two reg-  
9 ulators, both are necessary to satisfy Code and do not constitute wasteful duplica-  
10 tion of overpressure protection facilities; rather, there is an improved method of  
11 providing that protection. Columbia currently is not planning to purchase any  
12 new sites nor adding new low pressure stations though we are negotiating some  
13 larger easements to accommodate the added telemetry that is being installed.

14  
15 **Q: Will the LP Program conflict with existing certificates or service of other utilities**  
16 **under the jurisdiction of the Commission that are in the general or contiguous**  
17 **area in which Columbia provides service?**

18 **A:** No. The replacements of the pressure control equipment and the installations of the  
19 electronic monitoring equipment are only occurring on existing Columbia pressure

1 control sites. The new facilities will only render the described advantages to Colum-  
2 bia customers and will not affect the service of other natural gas utilities. Columbia  
3 provided with its Application a map from the Commission's website and overlaid  
4 red Xs which represent the approximate locations of the station work. Though other  
5 utilities appear in the general area of our work in Pike, Boyd, Greenup and Mont-  
6 gomery counties, these utilities will not be affected by Columbia's work.

7

8 **Q: Will the LP Program affect the timing of Columbia's AMRP?**

9 A: It will not. Columbia still intends to complete the AMRP in the original 30 year  
10 time frame. However, because of the accelerated actions resulting from the LP Pro-  
11 gram, Columbia reprioritized two projects to include bare steel replacement pro-  
12 jects that would eliminate additional low pressure district stations.

13

14 **Q: How does the elimination of low pressure district stations factor into the LP**  
15 **Program?**

16 A: Columbia identified 10 LP stations to be retired in Case No. 2018-00341 as part of  
17 Columbia's 2019 AMRP replacement of priority pipe. Since that time we have  
18 identified two additional stations we plan to retire in 2019 rather than install au-  
19 tomatic shut off valves at stations only to be retired in the next few years. The

1 elimination of low pressure stations has been a standard practice since the begin-  
2 ning of the AMRP.

3  
4 **Q: Was the elimination of low pressure stations identified in the initial application**  
5 **of the AMRP?**

6 A: Yes. It was identified as one of the economic benefits of replacing relatively larger  
7 diameter low pressure pipe with smaller diameter medium pressure pipe so Co-  
8 lumbia could potentially serve larger loads. The elimination of low pressure sta-  
9 tions results from replacing bare steel and cast iron pipe with plastic medium pres-  
10 sure pipe in sufficient quantities to remove the need to replace a costly district  
11 station. When the latent risk of overpressure was exposed, Columbia felt it pru-  
12 dent to re-prioritize some projects in order to eliminate those two stations faster.

13  
14 **Q: How many low pressure district stations have been eliminated as part of Co-**  
15 **lumbia's AMRP?**

16 A: Columbia has retired 33 low pressure stations since beginning its AMRP.

17  
18 **Q: In Columbia's initial application for the AMRP in Case No. 2009-00141, a soft-**  
19 **ware called Optimain was identified as a risk prioritization tool. Does Optimain**  
20 **quantify this newly identified risk in low pressure systems?**

1 A: Optimain is a decision support tool that identifies risk associated with main leaks.  
2 It does not have the functionality to quantify risk of overpressure events. The risk  
3 from significant system threats of various types, attributes or origins are evaluated  
4 as part of DIMP. The tragic events that occurred in Massachusetts shaped our de-  
5 cision to augment the proposed 2019 AMRP and the implementation of the LP  
6 Program which is consistent with the decision support nature of Optimain. We  
7 believed that from a safety perspective it was imperative to add additional protec-  
8 tions for our low pressure customers.

9

10 **Q: How will Columbia be identifying pipeline risk in the future?**

11 A: NiSource has defined our assets into six major categories: transmission lines, dis-  
12 tribution lines, measurement and pressure regulation/control equipment, gas stor-  
13 age and peaking facilities, gas service lines, and customer owned equipment and  
14 facilities. Columbia does not operate any gas storage or peaking facilities so there  
15 would only be five asset classes for Kentucky. A team will be assigned to each of  
16 these asset classes and will look at the risks associated with the assets from a broad  
17 perspective. This perspective not only includes the leakage history, severity, and  
18 age and condition of mains and services, but also the performance of the asset,  
19 aspects of human error and risks associated to outside forces and individuals. Op-  
20 tmain will remain a key decision support tool for identification of distribution line

1 and transmission line projects with Columbia's SMS augmenting and validating  
2 the project selection process. SMS is described in more detail in Columbia witness  
3 Dave Monte's testimony.

4  
5 **Q: Was Columbia planning to eliminate all low pressure systems by the end of the**  
6 **AMRP?**

7 A: No. Not all low pressure systems will be eliminated by the end of the AMRP be-  
8 cause there are approximately 146 miles of plastic pipe contained within Colum-  
9 bia's low pressure systems. In time, as business needs develop, that pipe could be  
10 uprated and the stations retired, but it is unlikely that will occur before the end of  
11 the AMRP. Additionally, there will be one small low pressure system in down-  
12 town Lexington with 3 or 4 stations supplying that system. This is because there  
13 currently is no place to set the service regulators outside the buildings that is mu-  
14 tually acceptable to Columbia and the City of Lexington.

15  
16 **Q: How does Columbia's selected solution to minimization of over-pressure events**  
17 **better protect Columbia's customers?**

18 A: The regulator used in this design is continuously on guard for exceedingly high  
19 pressures that could cause hazardous conditions in the low pressure systems that

1 supply our customers and is designed to react to those conditions before any ad-  
2 verse effects to our customers or their appliances occurs.

3  
4 **Q: What other options of added over-pressure protection for LP systems were con-**  
5 **sidered?**

6 A: Columbia first evaluated completely eliminating all LP pipe and stations through  
7 pipeline replacements and upgrading the customers to medium pressure; how-  
8 ever, it was determined that there were not enough contract and company re-  
9 sources to accomplish this task within the next few years. Additionally, replace-  
10 ment of cathodically protected steel and plastic pipe already supplying the low  
11 pressure systems would have created an unnecessary expense. Consequently, this  
12 option was eliminated. An order of magnitude estimate of such an effort could  
13 range between \$300,000,000 and \$400,000,000.

14 The subject matter experts working on the evaluation also considered full  
15 capacity relief valves, but decided against those in most cases due to the challenges  
16 in designing for full capacity on low pressure systems because a low pressure sys-  
17 tem has a very narrow range between the necessary operating pressure to keep  
18 customers in service and a pressure that would exceed the safe operating pressure  
19 of properly adjusted gas utilization equipment. Another challenge with full capac-  
20 ity relief valves would be the public nuisance and additional safety risks created

1 with discharging large volumes of gas to the atmosphere. Such discharges would  
2 often occur under electrical conductors or be restricted by trees thereby creating  
3 other safety risks in addition to those that are being mitigated.

4 Looking at the advantages and disadvantages of all the alternatives, Co-  
5 lumbia considers the installation of automatic shut-off valves on low pressure sys-  
6 tems to be the best alternative.

7

8 **Q: Is the LP Program that Columbia proposes the least cost option?**

9 **A:** In a few instances, full capacity relief valves could provide a least cost option, but  
10 the installation of such relief valves also introduces other risks to the public. For  
11 instance, if a low pressure system is small and has relatively small diameter pipe  
12 and the station is located in an open area away from buildings intended for human  
13 occupancy, then a low cost relief valve with relatively small diameter vent stack  
14 could be installed at a lower cost than the automatic shut off valve Columbia is us-  
15 ing. However, Columbia's low pressure stations more often supply large systems  
16 utilizing large volume pressure control equipment located in proximity to streets,  
17 homes, businesses and/or overhead electric or other utility lines. The relief valve  
18 necessary to vent large volumes of gas and the necessary labor for station modifica-

1 tions is comparable in cost to Columbia's chosen design; however, as stated previ-  
2 ously this venting of gas could present unintended hazards that Columbia wishes  
3 to avoid.

4  
5 **Q: Provide an example of a cost comparison.**

6 A: A full capacity relief valve would have to be designed to exhaust all of the gas that  
7 the regulators of a given district station are capable of supplying. For instance, a  
8 number of low pressure district stations serving Lexington and Ashland have a ca-  
9 pacity that exceeds 100,000 standard cubic feet per hour. A full capacity relief valve  
10 for this station would have to exhaust this rate of flow until a technician could re-  
11 spond to the abnormal operating condition and make the situation safe. This would  
12 require a four inch relief valve, a four inch valve controlling the relief valve, 4 inch  
13 vent piping and three inch access to the downstream pipeline. The estimated cost  
14 for such a full capacity relief design including material, labor and overheads is  
15 \$19,116. In contrast, the average actual cost to date for installing automatic shut off  
16 valves for six such stations already completed is \$16,372. Columbia has 193 low  
17 pressure stations that would have required large capacity relief valves ranging from  
18 venting 396,000 standard cubic feet per hour to 9,000 standard cubic feet per hour  
19 and each requiring similar amounts of labor to install.

20



1 **Q: Were there any other options considered for reducing the possibility of an over-**  
2 **pressure event?**

3 A: Many of the design practices discussed in the AGA's white paper titled *Leading*  
4 *Practices to Reduce the Possibility of a Natural Gas Over Pressurization Event* were eval-  
5 uated and considered. Some of those practices were already a part of Columbia's  
6 practices, some are in the process of implementation and other practices are not  
7 applicable to Columbia's operations. The automatic shut-off regulator fulfilled  
8 three of the practices described in the paper and offered the safety benefits that  
9 Columbia was seeking without adding other risks.

10

11 **Q: What are the benefits of the LP Program?**

12 A: In addition to the improved over-pressure protection for our customers, Columbia  
13 will be able to operate the district stations having the new equipment and hold a  
14 closer tolerance to the MAOP because the impact of regulator creep will be mini-  
15 mized. This will enable Columbia to retire some low pressure stations sooner than  
16 would otherwise be the case.

17

1 **Q: If historic pressure control methods were to continue, would this increase the**  
2 **risk to public safety?**

3 A: It would not increase the risk because the risk has always been an unidentified  
4 latent risk, but it would leave customers vulnerable to an overpressure event  
5 should one occur. The installation of automatic shut off valves on low pressure  
6 systems further enhances the safety of Columbia's customers.

7

8 **Q: Are you saying Columbia's low pressure systems are unsafe?**

9 A: No, the systems as designed and maintained are safe and compliant with existing  
10 Code. They are designed and maintained to operate in accordance with the mini-  
11 mum federal safety standards. However, with the industry's efforts and focus on  
12 continuously improving safety, the time is right to implement added safety  
13 measures even though they are in excess of the minimum federal safety standards.  
14 This is why Columbia is implementing the low pressure safety program at this  
15 time.

16

17 **Q: What is the estimated incremental annual cost of operations for the LP Program?**

18 A: Columbia estimates the incremental cost for the ASV inspections to add \$56,368  
19 annually and the cost for monitoring additional stations by Gas Control to be  
20 \$31,000 per year.

1

2 **VI. CONCLUSION**

3 **Q: Does this conclude your Prepared Direct Testimony?**

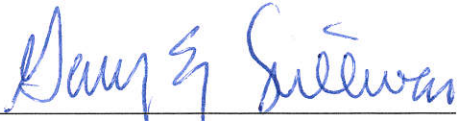
4 **A:** Yes, it does; however, I reserve the right to file rebuttal testimony if necessary.

COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION

In the matter of: )  
)  
THE ELECTRONIC APPLICATION OF COLUMBIA GAS OF )  
KENTUCKY, INC. FOR: 1) A DECLARATION THAT )  
CONSTRUCTION OF A LOW PRESSURE SYSTEM SAFETY )  
IMPROVEMENT IS AN EXTENSION OF ITS SYSTEM IN THE )  
ORDINARY COURSE OF BUSINESS; 2) IN THE ALTERNATIVE,)  
FOR THE ISSUANCE OF A CERTIFICATE OF PUBLIC ) Case No. 2019-00257  
CONVENIENCE AND NECESSITY FOR SUCH )  
CONSTRUCTION; 3) APPROVAL OF AN AMENDMENT AND )  
EXPANSION OF ITS ACCELERATED MAIN REPLACEMENT )  
TARIFF TO AN ACCELERATED SAFETY AND )  
REPLACEMENT TARIFF; AND (4) APPROVAL TO MODIFY )  
THE 2019 AMRP CONSTRUCTION PLAN )

CERTIFICATE AND AFFIDAVIT

The Affiant, Gary E. Sullivan, being duly sworn, deposes and states that the prepared testimony attached hereto and made a part hereof, constitutes the prepared direct testimony of this affiant in the above-captioned matter, and that if asked the questions propounded therein, this affiant would make the answers set forth in the attached prepared direct pre-filed testimony.

  
\_\_\_\_\_  
Gary E. Sullivan

COMMONWEALTH OF KENTUCKY

COUNTY OF FAYETTE

SUBSCRIBED AND SWORN to before me by Gary E. Sullivan on this the 24<sup>th</sup>  
day of July, 2019.

Evelyn Long Dun  
Notary Public

My Commission expires: 5/15/2022

			2019	2020	2021	2022	2023	2024
<b>CKY CAPITAL</b>		<b>\$11,152,514</b>	<b>\$9,347,429</b>	<b>\$776,580</b>	<b>\$1,028,505</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>WORK PACKAGE I</b>		<b>\$2,483,000</b>	<b>\$2,483,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>WORK PACKAGE II</b>		<b>\$366,000</b>	<b>\$0</b>	<b>\$366,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>WORK PACKAGE III</b>		<b>\$552,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$552,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>WORK PACKAGE IV</b>		<b>\$960,000</b>	<b>\$960,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>CUSTOMER SOLUTIONS</b>		<b>\$36,856</b>	<b>\$36,856</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>MATERIAL / EQUIPMENT</b>		<b>\$3,194,900</b>	<b>\$3,194,900</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>PROJECT CONTINGENCY</b>		<b>\$1,518,551</b>	<b>\$1,334,951</b>	<b>\$73,200</b>	<b>\$110,400</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>OWNERS COST</b>		<b>\$1,003,833</b>	<b>\$433,458</b>	<b>\$284,310</b>	<b>\$286,065</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>CONSTRUCTION OVERHEADS</b>		<b>\$1,037,374</b>	<b>\$904,264</b>	<b>\$53,070</b>	<b>\$80,040</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

Project Name	Project Id	Project City	Project Location	Pressure Control Solution Selected	Electronic Monitoring to Install	Start Month	Life to Date Cost
INSTALL FN 761 EXTRA LP OPP JO#18026800100	1856393	Maysville	KY 435	Add Customer Setting Regulators	Continuous system polling	August/December	\$ -
INSTALL FN 49 EXTRA LP OPP JO#18026801100	1858138	Lexington	Preston Ave	FT - Custom	Once a day polling	May	\$ 189
INSTALL FN 50 EXTRA LP OPP JO#18026801200	1858139	Lexington	Venice PK	MR-02-150	Once a day polling	May	\$ 13,974
INSTALL FN 59 EXTRA LP OPP JO#18026801800	1858140	Lexington	Penmoken PK	MR-02-150	Once a day polling	April	\$ 254,746
INSTALL FN 64 EXTRA LP OPP JO#18026802000	1858141	Lexington	Marquis Avenue	MR - Custom	Once a day polling	September	\$ -
INSTALL FN 72 EXTRA LP OPP JO#18026803000	1858142	Lexington	Broadway	MR-02-150	Continuous system polling	July	\$ 42
INSTALL FN 78 EXTRA LP OPP JO#18026803600	1858143	Lexington	Clays Mill Road	MR-02-150	Once a day polling	May	\$ 13,328
INSTALL FN 82 EXTRA LP OPP JO#18026804200	1858144	Lexington	Queensway Drive	MR - Custom	Once a day polling	TBD	\$ 2
INSTALL FN 83 EXTRA LP OPP JO#18026804300	1858145	Lexington	Glass Avenue	MR-02-150	Once a day polling	July	\$ 11,931
INSTALL FN 84 EXTRA LP OPP JO#18026804500	1858146	Lexington	Robertson Avenue	MR - Custom	Once a day polling	TBD	\$ -
INSTALL FN 86 EXTRA LP OPP JO#18026804800	1858147	Lexington	Tates Creek Road	GN - Custom	Once a day polling	September	\$ 29
INSTALL FN 88 EXTRA LP OPP JO#18026805200	1858148	Lexington	Oldham Avenue	MR-02-150	Once a day polling	June	\$ 11,297
INSTALL FN 89 EXTRA LP OPP JO#18026805400	1858149	Lexington	Barr Street	MR - Custom	Once a day polling	September	\$ 1
INSTALL FN 114 EXTRA LP OPP JO#18026806800	1858150	Lexington	Bryan Avenue	GN-030204-150	Once a day polling	August	\$ 1
INSTALL FN 115 EXTRA LP OPP JO#18026807000	1858151	Lexington	Smith Street	MR-04-150	Once a day polling	August	\$ 4
INSTALL FN 116 EXTRA LP OPP JO#18026807200	1858152	Lexington	Aurora Avenue	MR - Custom	Once a day polling	TBD	\$ 1
INSTALL FN 117 EXTRA LP OPP JO#18026807400	1858153	Lexington	Jersey	Custom Designed OPP Top Works	Continuous system polling	TBD	\$ 25
INSTALL FN 119 EXTRA LP OPP JO#18026807800	1858154	Lexington	Meadow	MR-02-150	Continuous system polling	June	\$ 7,944
INSTALL FN 212 EXTRA LP OPP JO#18026808000	1858155	Lexington	Third Street	MR-04-150	Continuous system polling	August	\$ 85
INSTALL FN 223 EXTRA LP OPP JO#18026808400	1858156	Lexington	Cooper Drive	MR - Custom	Once a day polling	TBD	\$ 2
INSTALL FN 224 EXTRA LP OPP JO#18026808600	1858157	Lexington	Richmond Road	MR - Custom	Once a day polling	TBD	\$ 1

Project Name	Project Id	Project City	Project Location	Pressure Control Solution Selected	Electronic Monitoring to Install	Start Month	Life to Date Cost
INSTALL FN 259 EXTRA LP OPP JO#18026808800	1858158	Lexington	Richmond Road	MR - Custom	Once a day polling	TBD	\$ 1
INSTALL FN 260 EXTRA LP OPP JO#18026809000	1858159	Lexington	Richmond Road	MR - Custom	Once a day polling	TBD	\$ 1
INSTALL FN 264 EXTRA LP OPP JO#18026809200	1858160	Lexington	Rose Street	MR-02-150	Once a day polling	June	\$ 9,440
INSTALL FN 265 EXTRA LP OPP JO#18026809400	1858161	Lexington	Press Avenue	MR - Custom	Once a day polling	TBD	\$ 2
INSTALL FN 266 EXTRA LP OPP JO#18026809600	1858162	Lexington	Versailles Road	MR - Custom	Once a day polling	TBD	\$ 1
INSTALL FN 267 EXTRA LP OPP JO#18026809800	1858163	Lexington	Maxwell Street	Custom Designed OPP Top Works	Once a day polling	TBD	\$ 1
INSTALL FN 275 EXTRA LP OPP JO#18026810200	1858164	Lexington	Bob O Link	MR - Custom	Once a day polling	September	\$ 30
INSTALL FN 278 EXTRA LP OPP JO#18026810400	1858165	Lexington	Bell Court	MR - Custom	Once a day polling	TBD	\$ 11
INSTALL FN 281 EXTRA LP OPP JO#18026810600	1858166	Lexington	Chinoe Road	LP Station Planned for Retirement	Telemetry Not Needed	Retire Station	\$ 1
INSTALL FN 308 EXTRA LP OPP JO#18026811000	1858167	Lexington	Tates Creek Road	LP Station Planned for Retirement	Telemetry Not Needed	Retire Station	\$ 27
INSTALL FN 311 EXTRA LP OPP JO#18026811200	1858168	Lexington	Manchester	FT - Custom	Continuous system polling	TBD	\$ 5
INSTALL FN 312 EXTRA LP OPP JO#18026811400	1858169	Lexington	New Circle Road	LP Station Planned for Retirement	Telemetry Not Needed	Retire Station	\$ 1
INSTALL FN 367 EXTRA LP OPP JO#18026811600	1858170	Lexington	Bucoto	MR-02-150	Continuous system polling	TBD	\$ 4
INSTALL FN 373 EXTRA LP OPP JO#18026811800	1858171	Lexington	Greenwood Drive	MR-02-150	Once a day polling	July	\$ 4,485
INSTALL FN 382 EXTRA LP OPP JO#18026812600	1858172	Lexington	Clay Avenue	LP Station Planned for Retirement	Telemetry Not Needed	Retire Station	\$ 3
INSTALL FN 842 EXTRA LP OPP JO#18026813000	1858173	Lexington	Cooper Drive	MR - Custom	Once a day polling	TBD	\$ 2
INSTALL FN 13351 EXTRA LP OPP JO#18026805600	1858174	Lexington	Goodwin Drive	MR-02-150	Once a day polling	June	\$ 9,441
INSTALL FN 13441 EXTRA LP OPP JO#18026806000	1858175	Lexington	Southland Drive	MR-02-150	Once a day polling	May	\$ 38,327
INSTALL FN 13476 EXTRA LP OPP JO#18026812800	1858176	Lexington	Paris Avenue	MR-02-150	Once a day polling	June	\$ 12,475
INSTALL FN 13481 EXTRA LP OPP JO#18026803200	1858177	Lexington	Broadway Street	MR-02-150	Once a day polling	July	\$ 5,885
INSTALL FN 13485 EXTRA LP OPP JO#18026802400	1858178	Lexington	Lane Allen Road	MR-02-150	Once a day polling	April	\$ 20,934



Project Name	Project Id	Project City	Project Location	Pressure Control Solution Selected	Electronic Monitoring to Install	Start Month	Life to Date Cost
INSTALL FN 13487 EXTRA LP OPP JO#18026805800	1858179	Lexington	Newtown Pike	MR-03-150	Once a day polling	August	\$ 3
INSTALL FN 13493 EXTRA LP OPP JO#18026804700	1858180	Lexington	Old Paris Road	GN-020202-150	Once a day polling	August	\$ 3
INSTALL FN 13501 EXTRA LP OPP JO#18026812000	1858181	Lexington	W. Main Street (Felix Street)	MR-03-150	Once a day polling	August	\$ 2
INSTALL FN 13502 EXTRA LP OPP JO#18026802600	1858182	Lexington	Nicholasville	MR-03-150	Continuous system polling	July	\$ 1
INSTALL FN 13503 EXTRA LP OPP JO#18026805000	1858183	Lexington	Eddie Street	FT - Custom	Once a day polling	September	\$ 13
INSTALL FN 13573 EXTRA LP OPP JO#18026806200	1858184	Lexington	3rd Street	MR-02-150	Once a day polling	June	\$ 11,755
INSTALL FN 13665 EXTRA LP OPP JO#18026808200	1858185	Lexington	Idle Hour	MR-02-150	Continuous system polling	June	\$ 4,059
INSTALL FN 14049 EXTRA LP OPP JO#18026803400	1858186	Lexington	Versailles Road	MR-02-150	Continuous system polling	July	\$ 4
INSTALL FN 14063 EXTRA LP OPP JO#18026801600	1858187	Lexington	Addison Street	MR-02-150	Once a day polling	May	\$ 10,087
INSTALL FN 14064 EXTRA LP OPP JO#18026810800	1858188	Lexington	Mason-Headley	MR-02-150	Continuous system polling	April	\$ 24,364
INSTALL FN 14068 EXTRA LP OPP JO#18026812400	1858189	Lexington	Alumni Drive	MR-02-150	Once a day polling	June	\$ 9,523
INSTALL FN 14143 EXTRA LP OPP JO#18026806600	1858190	Lexington	Loudon Avenue	MR-02-150	Once a day polling	May	\$ 21,960
INSTALL FN 14154 EXTRA LP OPP JO#18026804000	1858191	Lexington	Clays Mill Road	MR-03-150	Once a day polling	July	\$ 20
INSTALL FN 14160 EXTRA LP OPP JO#18026803800	1858192	Lexington	Mitchell Avenue	MR-02-150	Once a day polling	May	\$ 12,897
INSTALL FN 14168 EXTRA LP OPP JO#18026802800	1858193	Lexington	Cheryl Lane	FT-030304-150	Once a day polling	August	\$ 3
INSTALL FN 14184 EXTRA LP OPP JO#18026812200	1858194	Lexington	Rebecca Drive	MR - Custom	Once a day polling	September	\$ -
INSTALL FN 14197 EXTRA LP OPP JO#18026810000	1858195	Lexington	Burke Rd	LP Station Planned for Retirement	Telemetry Not Needed	Retire Station	\$ 1
INSTALL FN 14199 EXTRA LP OPP JO#18026806400	1858196	Lexington	Lima Drive	MR-02-150	Once a day polling	June	\$ 8,830
INSTALL FN 14207 EXTRA LP OPP JO#18026807600	1858197	Lexington	Loudon Avenue	MR-02-150	Once a day polling	June	\$ 10,471
INSTALL FN 14459 EXTRA LP OPP JO#18026802200	1858198	Lexington	Harrodsburg Road	MR-02-150	Once a day polling	July	\$ 1
INSTALL FN 16538 EXTRA LP OPP JO#18026801400	1858199	Lexington	Stone Road	MR-02-150	Once a day polling	May	\$ 11,066

Project Name	Project Id	Project City	Project Location	Pressure Control Solution Selected	Electronic Monitoring to Install	Start Month	Life to Date Cost
INSTALL FN 19921 EXTRA LP OPP JO#18026813200	1858200	Lexington	Wakefield Tr	MR-02-150	Continuous system polling	June	\$ 11,541
INSTALL FN 21499 EXTRA LP OPP JO#18026813700	1858201	Lexington	Chinoe Road	MR-02-150	Once a day polling	June	\$ 8,513
INSTALL FN 21500 EXTRA LP OPP JO#18026813900	1858201	Lexington	Chinoe Road	MR-02-150	Once a day polling	June	\$ 7,665
INSTALL FN 22195 EXTRA LP OPP JO#18026813400	1858202	Lexington	Young Drive	MR-02-150	Once a day polling	May	\$ 12,979
INSTALL FN 22196 EXTRA LP OPP JO#18026813600	1858202	Lexington	Young Drive	MR-02-150	Once a day polling	May	\$ 10,691
INSTALL FN 22270 EXTRA LP OPP JO#18026814100	1858203	Lexington	Shawneetown Drive	MR-03-150	Once a day polling	July	\$ -
INSTALL FN 22271 EXTRA LP OPP JO#18026814300	1858203	Lexington	Shawneetown Drive	MR-03-150	Once a day polling	July	\$ -
INSTALL FN 129 EXTRA LP OPP JO#18026814900	1858205	Frankfort	Lafayette Drive	MR - Custom	Once a day polling	August	\$ 6
INSTALL FN 130 EXTRA LP OPP JO#18026815100	1858206	Frankfort	Thomas Place	MR-02-150	Once a day polling	May	\$ 14,211
INSTALL FN 132 EXTRA LP OPP JO#18026815300	1858207	Frankfort	Holmes Street	MR-02-150	Continuous system polling	June	\$ 8,988
INSTALL FN 134 EXTRA LP OPP JO#18026815500	1858208	Frankfort	Lewis Street	MR-02-150	Once a day polling	June	\$ 11,996
INSTALL FN 135 EXTRA LP OPP JO#18026815700	1858209	Frankfort	Stanley Street	PT - Custom	Continuous system polling	August	\$ 3
INSTALL FN 136 EXTRA LP OPP JO#18026815900	1858210	Frankfort	Sutterlin Lane	MR-02-150	Continuous system polling	June	\$ 11,116
INSTALL FN 144 EXTRA LP OPP JO#18026816300	1858211	Frankfort	Strathmore Drive	LP Station Planned for Retirement	Telemetry Not Needed	Retire Station	\$ -
INSTALL FN 14506 EXTRA LP OPP JO#18026816500	1858211	Frankfort	Strathmore Drive	LP Station Planned for Retirement	Telemetry Not Needed	Retire Station	\$ -
INSTALL FN 147 EXTRA LP OPP JO#18026816700	1858212	Frankfort	Rolling Acres	MR-02-150	Once a day polling	July	\$ -
INSTALL FN 218 EXTRA LP OPP JO#18026819300	1858213	Frankfort	Holmes Street	MR-02-150	Once a day polling	June	\$ 13,189
INSTALL FN 219 EXTRA LP OPP JO#18026819500	1858214	Frankfort	Compton Drive	MR-02-150	Once a day polling	July	\$ -
INSTALL FN 350 EXTRA LP OPP JO#18026819700	1858215	Frankfort	Tanglewood Drive	GN - Custom	Once a day polling	August	\$ -
INSTALL FN 351 EXTRA LP OPP JO#18026819900	1858216	Frankfort	Service Drive	MR-02-150	Continuous system polling	TBD	\$ 1
INSTALL FN 352 EXTRA LP OPP JO#18026820100	1858217	Frankfort	Myrtle Avenue	MR-02-150	Once a day polling	July	\$ 3

Project Name	Project Id	Project City	Project Location	Pressure Control Solution Selected	Electronic Monitoring to Install	Start Month	Life to Date Cost
INSTALL FN 14426 EXTRA LP OPP JO#18026819100	1858218	Frankfort	Mockingbird Lane	MR-02-150	Once a day polling	July	\$ 979
INSTALL FN 14429 EXTRA LP OPP JO#18026816100	1858219	Frankfort	Walnut Street	MR-02-150	Once a day polling	June	\$ 6,766
INSTALL FN 190 EXTRA LP OPP JO#18026816900	1858221	Georgetown	Court Al	MR-02-150	Once a day polling	May	\$ 20,174
INSTALL FN 193 EXTRA LP OPP JO#18026817100	1858222	Georgetown	Hamilton Street	MR-02-150	Once a day polling	May	\$ 19,049
INSTALL FN 194 EXTRA LP OPP JO#18026817300	1858223	Georgetown	Court Alley	MR-02-150	Continuous system polling	May	\$ 22,018
INSTALL FN 199 EXTRA LP OPP JO#18026817500	1858224	Georgetown	College Street	MR-02-150	Once a day polling	May	\$ 18,237
INSTALL FN 202 EXTRA LP OPP JO#18026817700	1858225	Midway	Wassau Alley	FT-020202-150	Continuous system polling	August	\$ -
INSTALL FN 354 EXTRA LP OPP JO#18026820300	1858226	Midway	Winter Street	GN - Custom	Once a day polling	September	\$ 3
INSTALL FN 14557 EXTRA LP OPP JO#18026817900	1858227	Midway	Walnut Street	PT-03-150	Once a day polling	August	\$ 3
INSTALL FN 207 EXTRA LP OPP JO#18026818300	1858228	Versailles	Berry Avenue	MR-02-150	Once a day polling	May	\$ 22,369
INSTALL FN 208 EXTRA LP OPP JO#18026818500	1858229	Versailles	Locust Street	MR-02-150	Continuous system polling	June	\$ 16,082
INSTALL FN 209 EXTRA LP OPP JO#18026818700	1858230	Versailles	Highview Drive	PT - Custom	Once a day polling	September	\$ 2
INSTALL FN 210 EXTRA LP OPP JO#18026818900	1858231	Versailles	Woodridge Lane	MR-02-150	Once a day polling	June	\$ 21,121
INSTALL FN 14201 EXTRA LP OPP JO#18026818100	1858232	Versailles	Frankfort Street	MR-02-150	Once a day polling	May	\$ 26,941
INSTALL FN 232 EXTRA LP OPP JO#18026824600	1858233	Paris	Higgins Street	MR-02-150	Once a day polling	May	\$ 4,549
INSTALL FN 233 EXTRA LP OPP JO#18026824800	1858234	Paris	Thomas Street	MR-02-150	Once a day polling	TBD	\$ 3
INSTALL FN 234 EXTRA LP OPP JO#18026825000	1858235	Paris	Houston Avenue	MR-02-150	Once a day polling	April	\$ 5,643
INSTALL FN 235 EXTRA LP OPP JO#18026825200	1858236	Paris	Rucker Avenue	MR-02-150	Once a day polling	May	\$ 9,589
INSTALL FN 236 EXTRA LP OPP JO#18026825400	1858237	Paris	Elizabeth Street	MR-02-150	Once a day polling	May	\$ 6,931
INSTALL FN 240 EXTRA LP OPP JO#18026825600	1858238	Paris	High Street	MR-02-150	Once a day polling	May	\$ 7,210
INSTALL FN 314 EXTRA LP OPP JO#18026826000	1858239	Paris	Main Street	MR-02-150	Once a day polling	July	\$ 8,898

Project Name	Project Id	Project City	Project Location	Pressure Control Solution Selected	Electronic Monitoring to Install	Start Month	Life to Date Cost
INSTALL FN 316 EXTRA LP OPP JO#18026826200	1858240	Paris	Pleasant Street	FT-040204-150	Continuous system polling	July	\$ 2
INSTALL FN 317 EXTRA LP OPP JO#18026826400	1858241	Paris	Short Street	MR-02-150	Once a day polling	May	\$ 19,918
INSTALL FN 37 EXTRA LP OPP JO#18026820700	1858242	Winchester	Forrest Avenue	MR-02-150	Once a day polling	June	\$ 13,031
INSTALL FN 38 EXTRA LP OPP JO#18026820900	1858243	Winchester	Wall Alley	PT - Custom	Once a day polling	TBD	\$ 397
INSTALL FN 40 EXTRA LP OPP JO#18026821100	1858244	Winchester	Wall Alley	PT - Custom	Once a day polling	TBD	\$ -
INSTALL FN 41 EXTRA LP OPP JO#18026821300	1858245	Winchester	Wall Alley	MR - Custom	Continuous system polling	TBD	\$ -
INSTALL FN 42 EXTRA LP OPP JO#18026821500	1858246	Winchester	Alley Off Main	MR-02-150	Once a day polling	April	\$ 42,009
INSTALL FN 43 EXTRA LP OPP JO#18026821700	1858247	Winchester	Mutual Avenue	MR-02-150	Once a day polling	April	\$ 13,185
INSTALL FN 44 EXTRA LP OPP JO#18026821900	1858248	Winchester	Alley Off Park Av	MR-02-150	Once a day polling	May	\$ 9,087
INSTALL FN 45 EXTRA LP OPP JO#18026822100	1858249	Winchester	Alley Off Lincoln	Custom Designed OPP Top Works	Once a day polling	TBD	\$ 4
INSTALL FN 220 EXTRA LP OPP JO#18026824000	1858250	Winchester	Graves Street	MR-02-150	Once a day polling	May	\$ 8,946
INSTALL FN 357 EXTRA LP OPP JO#18026826600	1858251	Winchester	Burns Avenue	MR - Custom	Once a day polling	TBD	\$ 2
INSTALL FN 733 EXTRA LP OPP JO#18026828100	1858252	Winchester	Edgemont Drive	MR - Custom	Once a day polling	TBD	\$ 1
INSTALL FN 854 EXTRA LP OPP JO#18026828300	1858253	Winchester	Lexington Avenue	GN - Custom	Once a day polling	TBD	\$ 2
INSTALL FN 21193 EXTRA LP OPP JO#18026828600	1858254	Winchester	Boone Avenue	MR-02-150	Once a day polling	May	\$ 12,643
INSTALL FN 21194 EXTRA LP OPP JO#18026828800	1858255	Winchester	Boone Avenue	MR-02-150	Once a day polling	May	\$ 8,653
INSTALL FN 47 EXTRA LP OPP JO#18026822200	1858256	Irvine	Alley	MR-02-150	Continuous system polling	April	\$ 13,870
INSTALL FN 221 EXTRA LP OPP JO#18026824200	1858257	Irvine	Carhart Avenue	MR-02-150	Once a day polling	May	\$ 15,143
INSTALL FN 659 EXTRA LP OPP JO#18026827000	1858258	Irvine	Alley	MR-02-150	Once a day polling	June	\$ 13,989
INSTALL FN 661 EXTRA LP OPP JO#18026827200	1858259	Irvine	Broadway Street	MR-02-150	Once a day polling	June	\$ 14,342
INSTALL FN 13878 EXTRA LP OPP JO#18026825800	1858260	Irvine	Main Street	FT - Custom	Once a day polling	TBD	\$ 1

Project Name	Project Id	Project City	Project Location	Pressure Control Solution Selected	Electronic Monitoring to Install	Start Month	Life to Date Cost
INSTALL FN 48 EXTRA LP OPP JO#18026822400	1858261	Irvine	3rd St Alley	MR-02-150	Once a day polling	May	\$ 12,241
INSTALL FN 658 EXTRA LP OPP JO#18026826800	1858262	Irvine	Elm Street	MR-02-150	Once a day polling	May	\$ 12,226
INSTALL FN 161 EXTRA LP OPP JO#18026822600	1858263	Cynthiana	Moy Foo Alley	MR - Custom	Continuous system polling	TBD	\$ 2
INSTALL FN 162 EXTRA LP OPP JO#18026822800	1858264	Cynthiana	5th Street	MR-02-150	Continuous system polling	May	\$ 13,704
INSTALL FN 163 EXTRA LP OPP JO#18026823000	1858265	Cynthiana	Maple Street	Custom Designed OPP Top Works	Once a day polling	TBD	\$ -
INSTALL FN 164 EXTRA LP OPP JO#18026823200	1858266	Cynthiana	Wilson Avenue	MR - Custom	Once a day polling	TBD	\$ -
INSTALL FN 165 EXTRA LP OPP JO#18026823400	1858267	Cynthiana	Carr Alley	FT-040204-150	Once a day polling	TBD	\$ 5
INSTALL FN 690 EXTRA LP OPP JO#18026827400	1858268	Mount Sterling	Indian Mound Drive	GN - Custom	Continuous system polling	TBD	\$ 1
INSTALL FN 182 EXTRA LP OPP JO#18026823600	1858269	Mount Sterling	Queen Street	GN-030203-150	Once a day polling	July	\$ 980
INSTALL FN 183 EXTRA LP OPP JO#18026823800	1858270	Mount Sterling	Johnson Street	MR-02-150	Once a day polling	May	\$ 13,135
INSTALL FN 691 EXTRA LP OPP JO#18026827500	1858271	Mount Sterling	Rogers Avenue	MR-02-150	Once a day polling	May	\$ 15,575
INSTALL FN 693 EXTRA LP OPP JO#18026827700	1858272	Mount Sterling	White Avenue	MR-02-150	Once a day polling	May	\$ 17,450
INSTALL FN 694 EXTRA LP OPP JO#18026827900	1858273	Mount Sterling	Locust Street	MR-02-150	Continuous system polling	May	\$ 15,060
INSTALL FN 864 EXTRA LP OPP JO#18026828400	1858274	Mount Sterling	Bank Street	GN - Custom	Continuous system polling	TBD	\$ 2
INSTALL FN 13986 EXTRA LP OPP JO#18026824400	1858275	Mount Sterling	Richmond Avenue	MR-02-150	Once a day polling	May	\$ 13,739
INSTALL FN 5 EXTRA LP OPP JO#18026829000	1858276	Ashland	Bellefonte	GN-020202-150	Once a day polling	July	\$ 2
INSTALL FN 7 EXTRA LP OPP JO#18026829200	1858277	Ashland	French Broad	GN-020202-150	Once a day polling	July	\$ 5,731
INSTALL FN 216 EXTRA LP OPP JO#18026835800	1858278	Ashland	Buckley	MR-02-150	Once a day polling	May	\$ 9,735
INSTALL FN 10 EXTRA LP OPP JO#18026829400	1858279	Ashland	Sherwood	GN-020202-150	Once a day polling	July	\$ 4,888
INSTALL FN 11 EXTRA LP OPP JO#18026829600	1858280	Ashland	8th Street	LP Station Planned for Retirement	Telemetry Not Needed	Retire Station	\$ 197,765
INSTALL FN 12 EXTRA LP OPP JO#18026829800	1858281	Ashland	Kirk	MR-03-150	Once a day polling	May	\$ 21,778

Project Name	Project Id	Project City	Project Location	Pressure Control Solution Selected	Electronic Monitoring to Install	Start Month	Life to Date Cost
INSTALL FN 14 EXTRA LP OPP JO#18026830200	1858282	Ashland	Greenup	MR-03-150	Once a day polling	June	\$ 9,160
INSTALL FN 16 EXTRA LP OPP JO#18026830400	1858283	Ashland	22nd	MR-03-150	Once a day polling	June	\$ 11,760
INSTALL FN 17 EXTRA LP OPP JO#18026830600	1858284	Ashland	Palmer	MR-03-150	Once a day polling	June	\$ 8,936
INSTALL FN 18 EXTRA LP OPP JO#18026830800	1858285	Ashland	Chestnut	GN-020202-150	Once a day polling	July	\$ 1
INSTALL FN 19 EXTRA LP OPP JO#18026830900	1858286	Ashland	Woodland	GN-020202-150	Once a day polling	July	\$ 1
INSTALL FN 20 EXTRA LP OPP JO#18026831100	1858287	Ashland	Greenup	GN - Custom	Once a day polling	Apr-20	\$ 2
INSTALL FN 21 EXTRA LP OPP JO#18026831300	1858288	Ashland	29th Street	MR-03-150	Once a day polling	June	\$ 3,929
INSTALL FN 22 EXTRA LP OPP JO#18026831500	1858289	Ashland	Campbell	GN-040204-150	Once a day polling	Aug-19	\$ 2
INSTALL FN 23 EXTRA LP OPP JO#18026831700	1858290	Ashland	Douglas	MR-03-150	Once a day polling	June	\$ 3,907
INSTALL FN 24 EXTRA LP OPP JO#18026831900	1858291	Ashland	33rd	MR-03-150	Once a day polling	June	\$ 10,022
INSTALL FN 25 EXTRA LP OPP JO#18026832100	1858292	Ashland	Halbert	GN-020202-150	Once a day polling	July	\$ 979
INSTALL FN 26 EXTRA LP OPP JO#18026832300	1858293	Ashland	Belmont	GN-030303-150	Once a day polling	July	\$ 2
INSTALL FN 27 EXTRA LP OPP JO#18026832500	1858294	Ashland	39th	GN-020202-150	Once a day polling	July	\$ 979
INSTALL FN 28 EXTRA LP OPP JO#18026832700	1858295	Ashland	Blackburn Avenue	GN-030303-150	Continuous system polling	July	\$ 1
INSTALL FN 29 EXTRA LP OPP JO#18026832900	1858296	Ashland	Newman	GN - Custom	Once a day polling	TBD	\$ 1
INSTALL FN 804 EXTRA LP OPP JO#18026836900	1858297	Ashland	29th	GN-020202-150	Once a day polling	July	\$ 981
INSTALL FN 12954 EXTRA LP OPP JO#18026830000	1858298	Ashland	Ferguson	FT-030204-150	Once a day polling	July	\$ 3
INSTALL FN 20504 EXTRA LP OPP JO#18026837100	1858299	Ashland	Sword Street	LP Station Planned for Retirement	Telemetry Not Needed	Retire Station	\$ 2
INSTALL FN 31 EXTRA LP OPP JO#18026833100	1858300	Ashland	55th	MR - Custom	Once a day polling	TBD	\$ -
INSTALL FN 32 EXTRA LP OPP JO#18026833300	1858301	Catlettsburg	Center	FT - Custom	Once a day polling	TBD	\$ 5
INSTALL FN 33 EXTRA LP OPP JO#18026833500	1858302	Catlettsburg	Center	GN-020202-150	Once a day polling	TBD	\$ 2

Project Name	Project Id	Project City	Project Location	Pressure Control Solution Selected	Electronic Monitoring to Install	Start Month	Life to Date Cost
INSTALL FN 35 EXTRA LP OPP JO#18026833700	1858303	Catlettsburg	Louisa	GN-020202-150	Once a day polling	TBD	\$ 2
INSTALL FN 12813 EXTRA LP OPP JO#18026836400	1858304	Greenup	US 23	MR-02-150	Continuous system polling	June	\$ 9,202
INSTALL FN 12819 EXTRA LP OPP JO#18026836200	1858305	Greenup	Elm	MR-02-150	Once a day polling	June	\$ 16,128
INSTALL FN 153 EXTRA LP OPP JO#18026833900	1858306	Flatwoods	Argillite Road	LP Station Planned for Retirement	Telemetry Not Needed	Retire Station	\$ 468
INSTALL FN 154 EXTRA LP OPP JO#18026834100	1858307	Flatwoods	Powell Lane	FT-040204-150	Continuous system polling	TBD	\$ 3
INSTALL FN 155 EXTRA LP OPP JO#18026834300	1858308	Flatwoods	Mead Street	LP Station Planned for Retirement	Telemetry Not Needed	Retire Station	\$ 1
INSTALL FN 12831 EXTRA LP OPP JO#18026836500	1858309	Flatwoods	England Lane	MR-02-150	Once a day polling	May	\$ 19,812
INSTALL FN 157 EXTRA LP OPP JO#18026834700	1858310	Russell	Railroad	MR-03-150	Once a day polling	June	\$ 9,641
INSTALL FN 158 EXTRA LP OPP JO#18026834900	1858312	Raceland	Pond Run Road	MR-03-150	Continuous system polling	June	\$ 13,437
INSTALL FN 13023 EXTRA LP OPP JO#18026836000	1858313	Greenup	Laurel Street	MR-02-150	Once a day polling	June	\$ 9,611
INSTALL FN 160 EXTRA LP OPP JO#18026835200	1858314	Worthington	Ferry Street	GN-020202-150	Continuous system polling	TBD	\$ 1
INSTALL FN 12957 EXTRA LP OPP JO#18026835000	1858315	Worthington	3rd Street	MR-02-150	Continuous system polling	June	\$ 13,876
INSTALL FN 167 EXTRA LP OPP JO#18026835400	1858316	Louisa	Lackey	MR-02-150	Once a day polling	June	\$ 18,023
INSTALL FN 168 EXTRA LP OPP JO#18026835600	1858317	Louisa	Jefferson Street	GN-020202-150	Continuous system polling	TBD	\$ 983
INSTALL FN 254 EXTRA LP OPP JO#18026836700	1858318	Louisa	Pike	PT-02-150	Once a day polling	TBD	\$ 981
INSTALL FN 228 EXTRA LP OPP JO#18026838200	1858319	Foster	4th Street	Add Customer Setting Regulators	Continuous system polling	August/December	\$ 1
INSTALL FN 174 EXTRA LP OPP JO#18026837200	1858320	Maysville	2nd Street	MR-02-150	Continuous system polling	July	\$ 4
INSTALL FN 176 EXTRA LP OPP JO#18026837600	1858321	Maysville	4th	Custom Designed OPP Top Works	Once a day polling	TBD	\$ -
INSTALL FN 179 EXTRA LP OPP JO#18026838000	1858322	Maysville	Bugle	MR-02-150	Once a day polling	July	\$ -
INSTALL FN 257 EXTRA LP OPP JO#18026838400	1858323	Maysville	Carnation Station-1458	FT-020202-150	Continuous system polling	August	\$ 3
INSTALL FN 337 EXTRA LP OPP JO#18026838600	1858324	Maysville	KY 8 On Private R/W	Add Customer Setting Regulators	Continuous system polling	August/December	\$ -

Project Name	Project Id	Project City	Project Location	Pressure Control Solution Selected	Electronic Monitoring to Install	Start Month	Life to Date Cost
INSTALL FN 347 EXTRA LP OPP JO#18026839000	1858326	Maysville	5th	Custom Designed OPP Top Works	Once a day polling	September	\$ 30
INSTALL FN 758 EXTRA LP OPP JO#18026839200	1858327	Maysville	Reynolds	GN-020202-150	Once a day polling	August	\$ 1
INSTALL FN 19809 EXTRA LP OPP JO#18026837800	1858328	Maysville	2nd	MR-02-150	Once a day polling	July	\$ 599
INSTALL FN 19900 EXTRA LP OPP JO#18026839300	1858330	Maysville	Mitchell Alley	MR-02-150	Continuous system polling	July	\$ 4
INSTALL FN 13340 EXTRA LP OPP JO#18026840300	1858331	Beauty	SR40 Lower Beauty 1411	Add Customer Setting Regulators	Continuous system polling	August/December	\$ -
INSTALL FN 14992 EXTRA LP OPP JO#18026839500	1858332	Beauty	SR40 Upper Beauty 1412	Add Customer Setting Regulators	Continuous system polling	August/December	\$ 3
INSTALL FN 14977 EXTRA LP OPP JO#18026840100	1858333	Inez	Cassady Ave 1410	GN - Custom	Continuous system polling	TBD	\$ 8
INSTALL FN 15001 EXTRA LP OPP JO#18026839700	1858334	Inez	SR3 Inez Office 1408	MR-02-150	Continuous system polling	June	\$ 9,245
INSTALL FN 15120 EXTRA LP OPP JO#18026839900	1858335	South Williamson	Virginia Ave 1425	MR-02-150	Continuous system polling	TBD	\$ 3
INSTALL FN 762 EXTRA LP OPP JO#18026800200	1858491	Maysville	Germantown Road	Add Customer Setting Regulators	Once a day polling	August/December	\$ -
<b>Job Order Totals</b>							\$ 1,579,200



JOB NO. \_\_\_\_\_

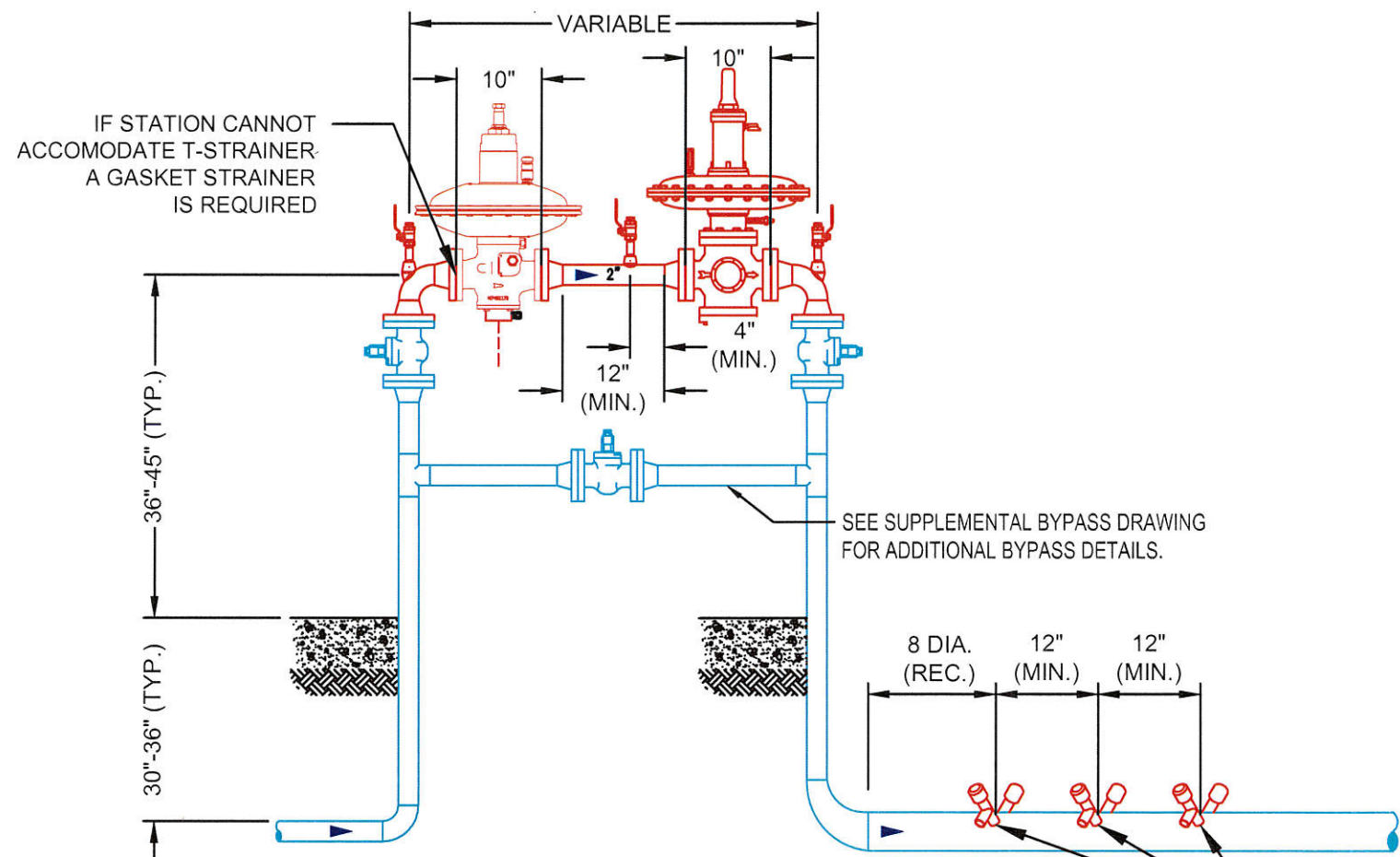
BILL OF MATERIAL

DWG. 1 OF 1

STOCK NO.	ITEM	QTY.	SIZE	DESCRIPTION
19-65-021	1	6	2"	FLG WELD NECK, FF, ANSI 150, F.S., BORED TO 0.154" WALL; 4 BOLTS PER FLANGE
28-46-406		32	5/8" x 3"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0321		8	2"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
17-15-095	2	2	2"	ELL, WELDING, 90 DEG., L.R., GRADE B, 0.154" WALL
17-86-013	3	2	1/2"	ELBOLET, FOR 3/4" THROUGH 36" PIPE, 3000 #, C.S.
24-04-230	4	4	1/2" x 3"	XH NIPPLE, GB, SMLS, CS A106, TBE
16-05-131		4	1/2"	VALVE, BALL, R.P., THREADED, SS, S8000-M3, 2000# W.O.G.
26-58-420		4	1/2"	PLUG, HEX HEAD, XH CS, 6000#, SA105
07-52-0200	5	2' (MIN.)	2"	PIPE, P.E., 0.154" STD WALL, X-52, BARE, C.S., ERW, API5L
48-99-050	6	1	2"	STRAINER, APOLLO, 02-TSW-275, 150#, CS GB, WLD X WLD, STR0022 W/100 MESH LINER
SPEC. ORDER	7	1	2"	REGULATOR, MONITOR, PIETRO FIORINTINI, NORVAL, 495Ø HEAD, DUCTILE IRON BODY, SEE TABLE 1 FOR MONITOR SPRING & SET POINTS. W/ ER MONITOR, W/ ON-BOARD SLAM SHUT, SLAM SHUT MODEL SN-91, RED/BLACK OPSO SPRING SET TO 20" w.c., (12" w.c. - 1.06 PSIG RANGE), WHITE UPSO SPRING SET TO 4" w.c., (4" w.c. - 9.2" w.c. RANGE), ANSI 150, 275# WP, MONITOR POSITION, FIELD ADJUST SET PT.
17-88-028	8	1	1/2"	THREDOLET, FOR 2" THROUGH 2-1/2" PIPE, 3000 #, C.S.
SPEC. ORDER	9	1	2"	REGULATOR, CONTROL, 441/461 OR MOONEY, ANSI-125/150
19-14-011	T1	2	2"	FLANGE, BLIND, ANSI 150, F.F., CS, SA105; 4 BOLTS PER FLANGE
28-46-406		12	5/8" x 3"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0321		4	2"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
SPEC. ORDER	G1	AS NEEDED	2" 5/8" x 3-3/4"	GASKET, STRAINER, MFG VSP, TORQ-KIT, ANSI-150, 316SS MESH SCREEN, WITH STUDS AND NUTS STUD BOLT, A193 B7, XYLAN COATED WITH 2 XYLAN COATED NUTS

TABLE 1

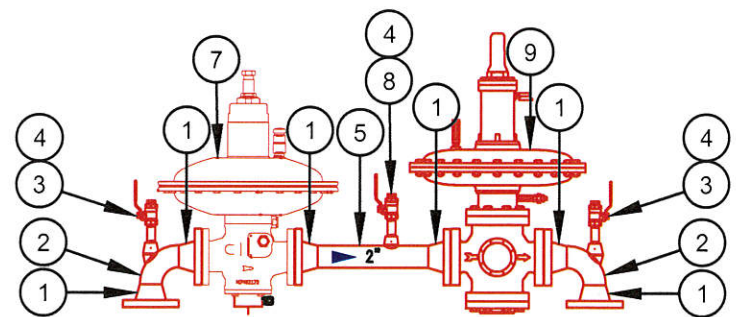
REGULATOR SIZE	AVAILABLE SPRING RANGE	RECOMMENDED SET POINTS
2" NORVAL 495Ø HEAD	10.04" - 14.06"wc	BLACK SPRING
	12.45" - 16.87"wc	BLUE SPRING
	15.27" - 24.11"wc	WHITE SPRING
3" NORVAL 630Ø HEAD	8.43" - 14.46"wc	WHITE SPRING
	11.25" - 19.28"wc	YELLOW SPRING
4" NORVAL 630Ø HEAD	8.84" - 14.86"wc	WHITE SPRING
	12.05" - 20.09"wc	YELLOW SPRING



DIAMETERS TO BE CALCULATED OFF TAPPING PIPE SIZE  
 MINIMUM 5 CONTROL LINE PORTS REQUIRED FOR NORVAL MONITOR/SENSUS CONTROL  
 CONTROL LINE PORTS TO BE INSTALLED IN 10 O'CLOCK AND 2 O'CLOCK POSITION  
 SEE SUPPLEMENTAL CONTROL DRAWING FOR CONTROL LINE DETAILS

**2" x 2" TOPWORKS REPLACEMENT -- TYPICAL**  
 1"=20"

**\*\*NOTE\*\* TOTAL STATION SHUT DOWN IS RECOMMENDED BEFORE COMMENCING WORK**



**2" x 2" TOPWORKS DESIGN -- TYPICAL**  
 1"=20"

DESIGN NOTE

1. %SMYS BASED OFF NEWLY INSTALLED EQUIPMENT
2. EXISTING EQUIPMENT %SYMS TO BE CALCULATED BY OTHERS
3. MAOP LIMITING ELEMENT BASED OFF OF NEWLY INSTALLED EQUIPMENT

DESIGN DATA (EXCLUDING REGS)		
DESIGN FACTOR	0.4	REF. CFR 192.111
DESIGN PRESSURE	275 PSIG	>= INLET MAOP
% SMYS AT DESIGN PRESSURE	6.06%	% SMYS BASED ON: 2", 0.154" w, GR. B
MIN. TEST PRESSURE	413 PSIG	(1.5 X DESIGN PRESSURE)
MAX. TEST PRESSURE	450 PSIG	(PER ANSI B16.5)
MIN. TEST DURATION	FIELD DET.	(PER GS 1500.010)
% SMYS AT MIN. PRESSURE TEST	9.10%	% SMYS BASED ON: 2", 0.154" w, GR. B
% SMYS AT MAX. PRESSURE TEST	9.91%	% SMYS BASED ON: 2", 0.154" w, GR. B
% SMYS AT MAOP	6.06%	% SMYS BASED ON: 2", 0.154" w, GR. B
MAOP LIMITING ELEMENT	PRESSURE TEST OR LOWEST FITTING MWP	
TEST MEDIUM	NITROGEN/AIR	
% X-RAY	PER GAS STANDARDS	

C	2/13/19	TLATTA	GSMILLER	MODIFIED DESIGN BLOCK
NO.	DATE	DRAWN	APPROVED	REVISION DESCRIPTION

<b>NISource</b> Energy Distribution	DRAWN	TLATTA	DATE	10/11/18	DRAWING TITLE	2" x 2" TOPWORKS REPLACEMENT WITH 2" REGS - TYPICAL
	CHKD	G.S MILLER	DATE	10/19/18	ELEVATION VIEW	
	SCALE	AS NOTED	PROJECT TITLE	NISOURCE LP STATION INITIATIVE		
	CITY/COUNTY	####	LP STATION DRAWING			
STATE	####	SIZE	L	PROJECT ID	FT-020202-150	PAGE NO
						1 OF 1

JOB NO. \_\_\_\_\_ BILL OF MATERIAL DWG. 1 OF 1

STOCK NO.	ITEM	QTY.	SIZE	DESCRIPTION
19-65-021	1	4	2"	FLG WELD NECK, FF, ANSI 150, F.S., BORED TO 0.154" WALL; 4 BOLTS PER FLANGE
28-46-406	24		5/8" x 3"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0321	6		2"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
17-26-106	2	1	3" x 2"	ELL, REDUCING, GRADE B, 0.216" x 0.154" WALL
17-86-013	3	2	1/2"	ELBOLET, FOR 3/4" THROUGH 36" PIPE, 3000 #, C.S.
24-04-230	4	4	1/2" x 3"	XH NIPPLE, GB, SMLS, CS A106, TBE
16-05-131	4	4	1/2"	VALVE, BALL, R.P., THREADED, SS, S8000-M3, 2000# W.O.G.
26-58-420	4	4	1/2"	PLUG, HEX HEAD, XH CS, 6000#, SA105
07-52-0200	5	2' (MIN.)	2"	PIPE, P.E., 0.154" STD WALL, X-52, BARE, C.S., ERW, API5L
48-99-050	6	1	2"	STRAINER, APOLLO, 02-TSW-275, 150#, CS GB, WLD X WLD, STR0022 W/100 MESH LINER
SPEC. ORDER	7	1	2"	REGULATOR, MONITOR, PIETRO FIORINTINI, NORVAL, 495Ø HEAD, DUCTILE IRON BODY, SEE TABLE 1 FOR MONITOR SPRING & SET POINTS. W/ ER MONITOR, W/ ON-BOARD SLAM SHUT, SLAM SHUT MODEL SN-91, RED/BLACK OPSO SPRING SET TO 20" w.c., (12" w.c. - 1.06 PSIG RANGE), WHITE UPSO SPRING SET TO 4" w.c., (4" w.c. - 9.2" w.c. RANGE), ANSI 150, 275# WP, MONITOR POSITION, FIELD ADJUST SET PT.
17-88-028	8	1	1/2"	THREDOLET, FOR 2" THROUGH 2-1/2" PIPE, 3000 #, C.S.
SPEC. ORDER	9	1	2"	REGULATOR, CONTROL, 441/461 OR MOONEY, ANSI-125/150
17-26-170	10	1	4" x 3"	ELL, REDUCING, GRADE B, 0.237" x 0.216" WALL
19-65-032	11	1	3"	FLG WELD NECK, FF, ANSI 150, F.S., BORED TO 0.216" WALL; 4 BOLTS PER FLANGE
28-46-408	4	4	5/8" x 3-1/2"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0441	1	1	3"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
19-65-048	12	1	4"	FLG WELD NECK, FF, ANSI 150, F.S., BORED TO 0.237" WALL; 8 BOLTS PER FLANGE
28-46-408	8	8	5/8" x 3-1/2"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0561	1	1	4"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
19-14-015	T1	1	3"	FLANGE, BLIND, ANSI 150, F.F., CS, SA105; 4 BOLTS PER FLANGE
28-46-408	8	8	5/8" x 3-1/2"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0441	3	3	3"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
19-14-019	T2	1	4"	FLANGE, BLIND, ANSI 150, F.F., CS, SA105; 8 BOLTS PER FLANGE
28-46-408	16	16	5/8" x 3-1/2"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0561	3	3	4"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
SPEC. ORDER	G1	AS NEEDED	2"	GASKET, STRAINER, MFG VSP, TORQ-KIT, ANSI-150, 316SS MESH SCREEN, WITH STUDS AND NUTS
			5/8" x 3-3/4"	STUD BOLT, A193 B7, XLYAN COATED WITH 2 XLYAN COATED NUTS

**DESIGN NOTE**

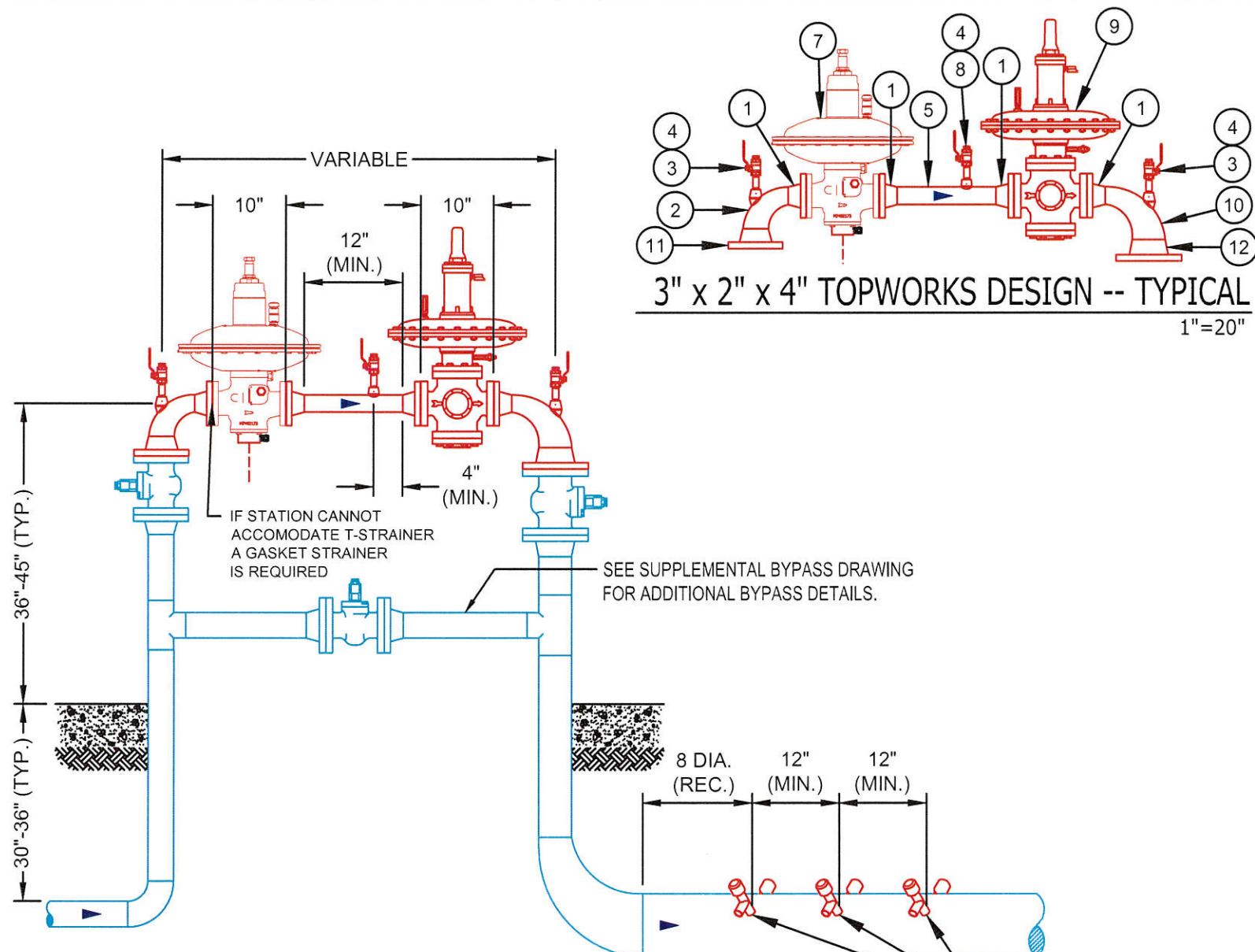
1. %SMYS BASED OFF NEWLY INSTALLED EQUIPMENT
2. EXISTING EQUIPMENT %SYMS TO BE CALCULATED BY OTHERS
3. MAOP LIMITING ELEMENT BASED OFF OF NEWLY INSTALLED EQUIPMENT

DESIGN DATA (EXCLUDING REGS)		
DESIGN FACTOR	0.4	REF. CFR 192.111
DESIGN PRESSURE	275 PSIG	>= INLET MAOP
% SMYS AT DESIGN PRESSURE	7.46%	% SMYS BASED ON: 4", 0.237" w, GR. B.
MIN. TEST PRESSURE	413 PSIG	(1.5 X DESIGN PRESSURE)
MAX. TEST PRESSURE	450 PSIG	(PER ANSI B16.5)
MIN. TEST DURATION	FIELD DET.	(PER GS 1500.010)
% SMYS AT MIN. PRESSURE TEST	11.20%	% SMYS BASED ON: 4", 0.237" w, GR. B.
% SMYS AT MAX. PRESSURE TEST	12.21%	% SMYS BASED ON: 4", 0.237" w, GR. B.
% SMYS AT MAOP	7.46%	% SMYS BASED ON: 4", 0.237" w, GR. B.
MAOP LIMITING ELEMENT	PRESSURE TEST OR LOWEST FITTING MWFP	
TEST MEDIUM	NITROGEN/AIR	
% X-RAY	PER GAS STANDARDS	

**\*\*NOTE\*\* TOTAL STATION SHUT DOWN IS RECOMMENDED BEFORE COMMENCING WORK**

TABLE 1

REGULATOR SIZE	AVAILABLE SPRING RANGE	RECOMMENDED SET POINTS
2" NORVAL 495Ø HEAD	10.04" - 14.06"wc BLACK SPRING 12.45" - 16.87"wc BLUE SPRING 15.27" - 24.11"wc WHITE SPRING	10" - 13"wc SET POINT 14" - 16" wc SET POINT 17" - 18" wc SET POINT
3" NORVAL 630Ø HEAD	8.43" - 14.46"wc WHITE SPRING 11.25" - 19.28"wc YELLOW SPRING	10" - 13"wc SET POINT 14" - 18" wc SET POINT
4" NORVAL 630Ø HEAD	8.84" - 14.86"wc WHITE SPRING 12.05" - 20.09"wc YELLOW SPRING	10" - 13"wc SET POINT 14" - 18" wc SET POINT



MINIMUM 5 CONTROL LINE PORTS REQUIRED FOR NORVAL MONITOR/SENSUS CONTROL  
 CONTROL LINE PORTS TO BE INSTALLED IN 10 O'CLOCK AND 2 O'CLOCK POSITION  
 SEE SUPPLEMENTAL CONTROL DRAWING FOR CONTROL LINE DETAILS

**3" x 2" x 4" TOPWORKS REPLACEMENT -- TYPICAL**

	DATE	10/11/18	DRAWING TITLE	3" x 4" TOPWORKS REPLACEMENT WITH 2" REGS - TYPICAL ELEVATION VIEW
	DWG. CHECKED	G.S MILLER	DATE	10/19/18
	SCALE	AS NOTED	PROJECT TITLE	NISOURCE LP STATION INITIATIVE LP STATION DRAWING
	CITY/COUNTY	STATE	PROJECT ID	FT-030204-150
NO. DATE DRAWN APPROVED REVISION DESCRIPTION		1 2/13/19 TLATTA GSMILLER MODIFIED DESIGN BLOCK		

JOB NO. \_\_\_\_\_ BILL OF MATERIAL DWG. 1 OF 1

STOCK NO.	ITEM	QTY.	SIZE	DESCRIPTION
19-65-032	1	5	3"	FLG WELD NECK, FF, ANSI 150, F.S., BORED TO 0.216" WALL; 4 BOLTS PER FLANGE
28-46-408	28		5/8" x 3-1/2"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0441	7		3"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
17-15-127	2	1	3"	ELL, WELDING, 90 DEG., L.R., GRADE B, 0.216" WALL
17-96-013	3	2	1/2"	ELBOLET, FOR 3/4" THROUGH 36" PIPE, 3000 #, C.S.
24-04-230	4	4	1/2" x 3"	XH NIPPLE, GB, SMLS, CS A106, TBE
16-05-131	4		1/2"	VALVE, BALL, R.P., THREADED, SS, S8000-M3, 2000# W.O.G.
26-58-420	4		1/2"	PLUG, HEX HEAD, XH CS, 6000#, SA105
07-52-0300	5	2' (MIN.)	3"	PIPE, P.E., 0.216" STD WALL, X-52, BARE, C.S., ERW, API5L
48-99-051	6	1	3"	STRAINER, APOLLO, 03-TSW-275, 150#, CS GB, WLD X WLD, STR0022 W/100 MESH LINER
SPEC. ORDER	7	1	3"	REGULATOR, MONITOR, PIETRO FIORINTINI, NORVAL, 6300 HEAD, DUCTILE IRON BODY, SEE TABLE 1 FOR MONITOR SPRING & SET POINTS, W/ ER MONITOR, W/ ON-BOARD SLAM SHUT, SLAM SHUT MODEL SN-91, RED/BLACK OPSO SPRING SET TO 20" w.c., (12" w.c. - 1.06 PSIG RANGE), WHITE UPSO SPRING SET TO 4" w.c., (4" w.c. - 9.2" w.c. RANGE), ANSI 150, 275# WP, MONITOR POSITION, FIELD ADJUST SET POINT
17-88-030	8	1	1/2"	THREDOLET, FOR 3" THROUGH 8" PIPE, 3000 #, C.S.
SPEC. ORDER	9	1	3"	REGULATOR, CONTROL, 441 OR MOONEY, ANSI-125/150
17-26-170	10	1	4" x 3"	ELL, REDUCING, GRADE B, 0.237" x 0.216" WALL
19-65-048	11	1	4"	FLG WELD NECK, FF, ANSI 150, F.S., BORED TO 0.237" WALL; 8 BOLTS PER FLANGE
28-46-408	8		5/8" x 3-1/2"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0561	1		4"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
19-14-015	T1	1	3"	FLANGE, BLIND, ANSI 150, F.F., CS, SA105; 4 BOLTS PER FLANGE
28-46-408	8		5/8" x 3-1/2"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0441	3		3"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
19-14-019	T2	1	4"	FLANGE, BLIND, ANSI 150, F.F., CS, SA105; 8 BOLTS PER FLANGE
28-46-408	16		5/8" x 3-1/2"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0561	3		4"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
SPEC. ORDER	G1	AS NEEDED	3"	GASKET, STRAINER, MFG VSP, TORQ-KIT, ANSI-150, 316SS MESH SCREEN, WITH STUDS AND NUTS
			5/8" x 4"	STUD BOLT, A193 B7, Xylan COATED WITH 2 Xylan COATED NUTS

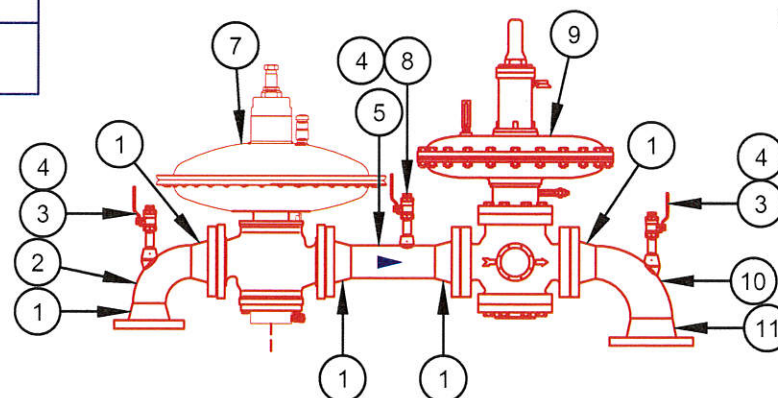
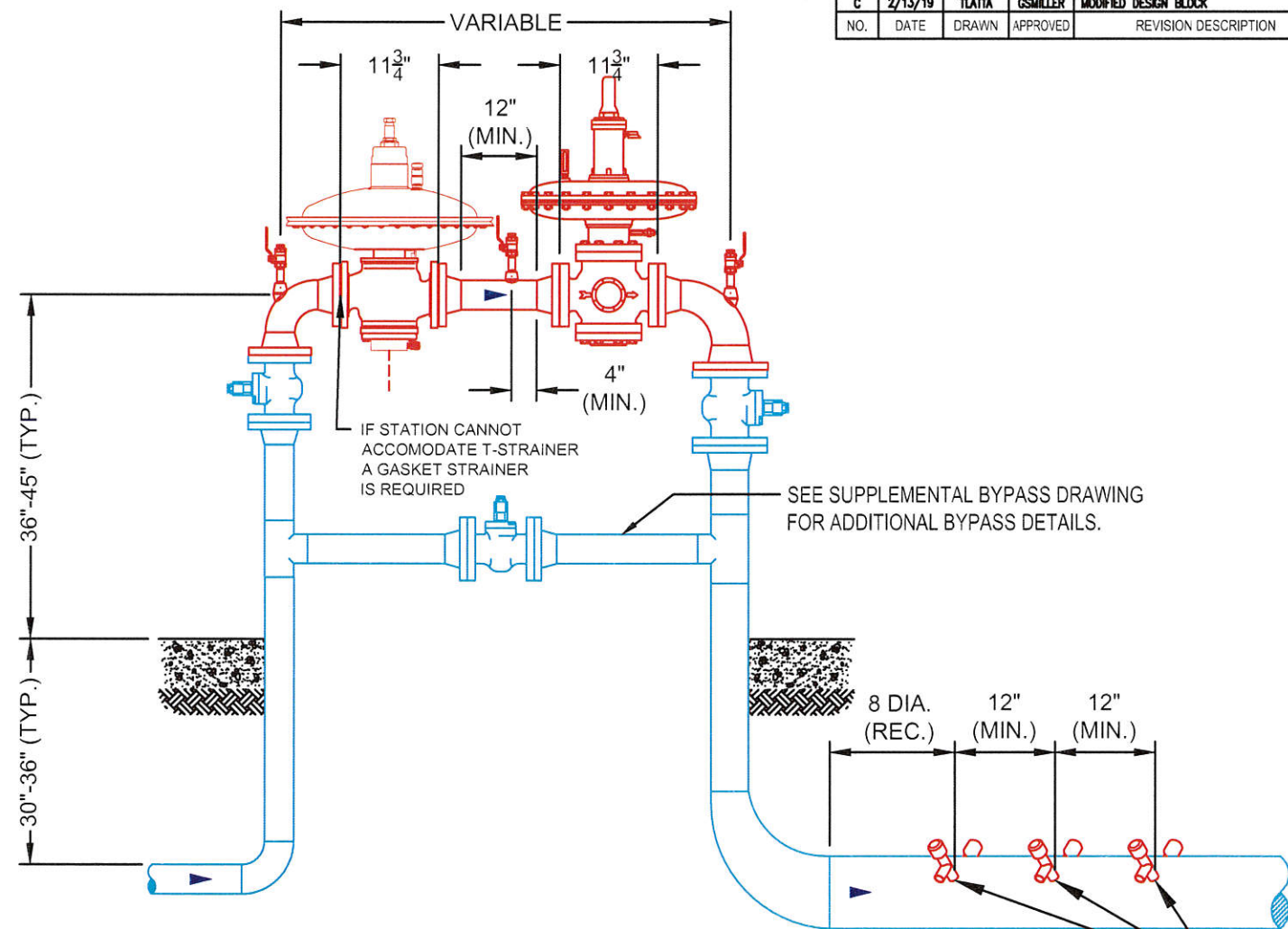
TABLE 1

REGULATOR SIZE	AVAILABLE SPRING RANGE	RECOMMENDED SET POINTS
2" NORVAL 4950 HEAD	10.04" - 14.06"wc	BLACK SPRING
	12.45" - 16.87"wc	BLUE SPRING
	15.27" - 24.11"wc	WHITE SPRING
3" NORVAL 6300 HEAD	8.43" - 14.46"wc	WHITE SPRING
	11.25" - 19.28"wc	YELLOW SPRING
4" NORVAL 6300 HEAD	8.84" - 14.86"wc	WHITE SPRING
	12.05" - 20.09"wc	YELLOW SPRING

DESIGN DATA (EXCLUDING REGS)		
DESIGN FACTOR	0.4	REF. CFR 192.111
DESIGN PRESSURE	275 PSIG	>= INLET MAOP
% SMYS AT DESIGN PRESSURE	7.46%	% SMYS BASED ON: 4", 0.237" w, GR. B.
MIN. TEST PRESSURE	413 PSIG	(1.5 X DESIGN PRESSURE)
MAX. TEST PRESSURE	450 PSIG	(PER ANSI B16.5)
MIN. TEST DURATION	FIELD DET.	(PER GS 1500.010)
% SMYS AT MIN. PRESSURE TEST	11.20%	% SMYS BASED ON: 4", 0.237" w, GR. B.
% SMYS AT MAX. PRESSURE TEST	12.21%	% SMYS BASED ON: 4", 0.237" w, GR. B.
% SMYS AT MAOP	7.46%	% SMYS BASED ON: 4", 0.237" w, GR. B.
MAOP LIMITING ELEMENT	PRESSURE TEST OR LOWEST FITTING MWP	
TEST MEDIUM	NITROGEN/AIR	
% X-RAY	PER GAS STANDARDS	

DESIGN NOTE

1. %SMYS BASED OFF NEWLY INSTALLED EQUIPMENT
2. EXISTING EQUIPMENT %SYMS TO BE CALCULATED BY OTHERS
3. MAOP LIMITING ELEMENT BASED OFF OF NEWLY INSTALLED EQUIPMENT



DIAMETERS TO BE CALCULATED OFF TAPPING PIPE SIZE  
 MINIMUM 5 CONTROL LINE PORTS REQUIRED FOR NORVAL MONITOR/SENSUS CONTROL  
 CONTROL LINE PORTS TO BE INSTALLED IN 10 O'CLOCK AND 2 O'CLOCK POSITION  
 SEE SUPPLEMENTAL CONTROL DRAWING FOR CONTROL LINE DETAILS

3" x 3" x 4" TOPWORKS REPLACEMENT -- TYPICAL  
 1"=20"

**\*\*NOTE\*\* TOTAL STATION SHUT DOWN IS RECOMMENDED BEFORE COMMENCING WORK**

3" x 3" x 4" TOPWORKS DESIGN -- TYPICAL  
 1"=20"

	DATE	10/11/18	DRAWING TITLE	3" x 4" TOPWORKS REPLACEMENT WITH 3" REGS - TYPICAL
	DATE	10/19/18	DRAWING TITLE	ELEVATION VIEW
	SCALE	AS NOTED	PROJECT TITLE	NISOURCE LP STATION INITIATIVE
	CITY/COUNTY	####	PROJECT TITLE	LP STATION DRAWING
STATE	####	SIZE	L	PROJECT ID
				FT-030304-150
				1 OF 1

JOB NO. \_\_\_\_\_

BILL OF MATERIAL

DWG. 1 OF 1

STOCK NO.	ITEM	QTY.	SIZE	DESCRIPTION
19-65-021	1	4	2"	FLG WELD NECK, FF, ANSI 150, F.S., BORED TO 0.154" WALL; 4 BOLTS PER FLANGE
28-46-406	24		5/8" x 3"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0321	6		2"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
17-26-160	2	2	4" x 2"	ELL, REDUCING, GRADE B, 0.237" x 0.154" WALL
17-86-013	3	2	1/2"	ELBOLET, FOR 3/4" THROUGH 36" PIPE, 3000 #, C.S.
24-04-230	4	4	1/2" x 3"	XH NIPPLE, GB, SMLS, CS A106, TBE
16-05-131	4	4	1/2"	VALVE, BALL, R.P., THREADED, SS, S8000-M3, 2000# W.O.G.
26-58-420	4	4	1/2"	PLUG, HEX HEAD, XH CS, 6000#, SA105
07-52-0200	5	2' (MIN.)	2"	PIPE, P.E., 0.154" STD WALL, X-52, BARE, C.S., ERW, API5L
48-99-050	6	1	2"	STRAINER, APOLLO, 02-TSW-275, 150#, CS GB, WLD X WLD, STR0022 W/100 MESH LINER
SPEC. ORDER	7	1	2"	REGULATOR, MONITOR, PIETRO FIORINTINI, NORVAL, 495Ø HEAD, DUCTILE IRON BODY, SEE TABLE 1 FOR MONITOR SPRING & SET POINTS, W/ ER MONITOR, W/ ON-BOARD SLAM SHUT, SLAM SHUT MODEL SN-91, RED/BLACK OPSO SPRING SET TO 20" w.c., (12" w.c. - 1.06 PSIG RANGE), WHITE UPSO SPRING SET TO 4" w.c., (4" w.c. - 9.2" w.c. RANGE), ANSI 150, 275# WP, MONITOR POSITION, FIELD ADJUST SET PT.
17-88-028	8	1	1/2"	THREDOLET, FOR 2" THROUGH 2-1/2" PIPE, 3000 #, C.S.
SPEC. ORDER	9	1	2"	REGULATOR, CONTROL, 441/461 OR MOONEY, ANSI-125/150
19-65-048	10	2	4"	FLG WELD NECK, FF, ANSI 150, F.S., BORED TO 0.237" WALL; 8 BOLTS PER FLANGE
28-46-408	16		5/8" x 3-1/2"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0561	2		4"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
19-14-019	T1	2	4"	FLANGE, BLIND, ANSI 150, F.F., CS, SA105; 8 BOLTS PER FLANGE
28-46-408	24		5/8" x 3-1/2"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0561	4		4"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
SPEC. ORDER	G1	AS NEEDED	2" 5/8" x 3-3/4"	GASKET, STRAINER, MFG VSP, TORQ-KIT, ANSI-150, 316SS MESH SCREEN, WITH STUDS AND NUTS STUD BOLT, A193 B7, XYLAN COATED WITH 2 XYLAN COATED NUTS

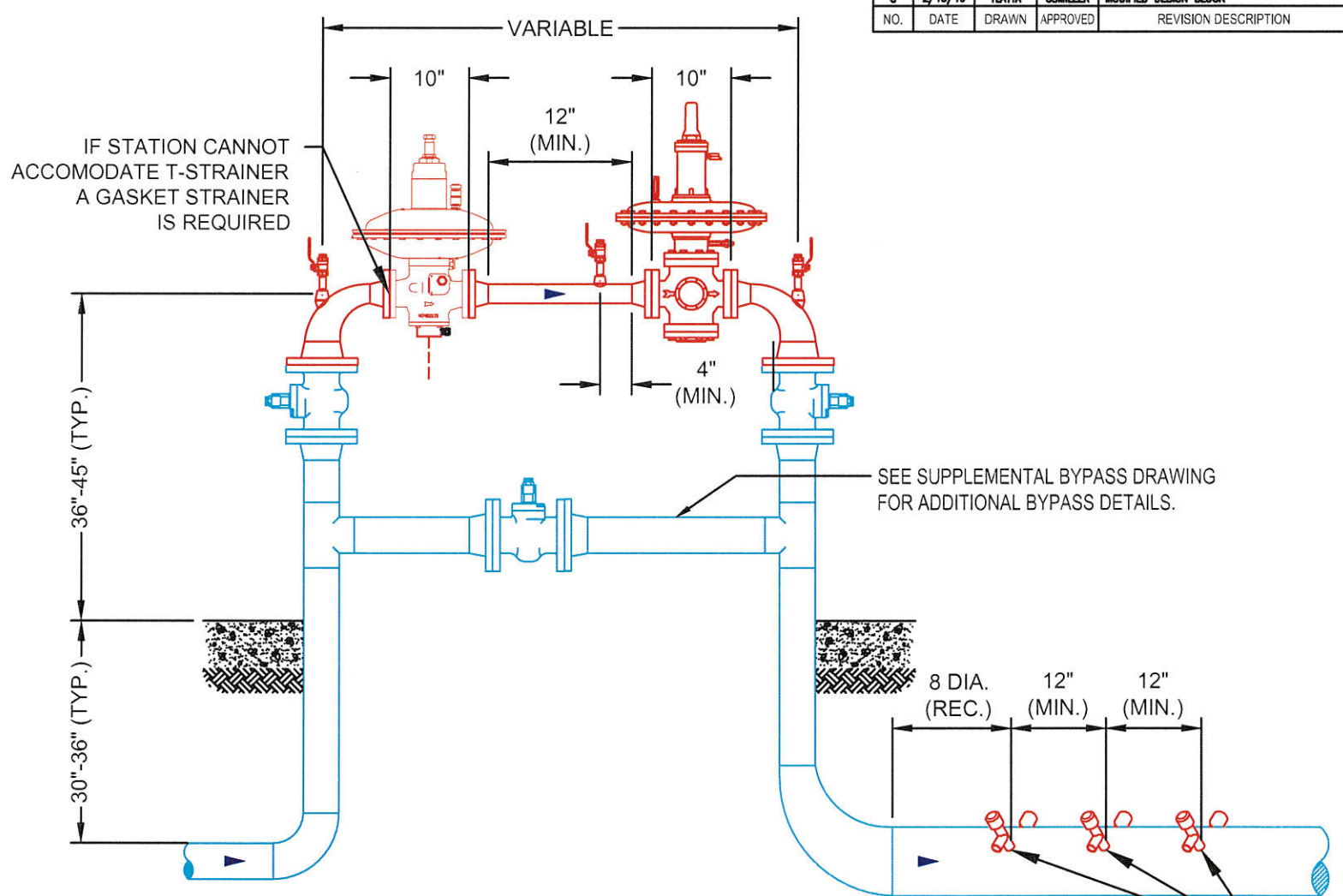
TABLE 1

REGULATOR SIZE	AVAILABLE SPRING RANGE	RECOMMENDED SET POINTS
2" NORVAL 495Ø HEAD	10.04" - 14.06"wc	BLACK SPRING 10" - 13"wc SET POINT
	12.45" - 16.87"wc	BLUE SPRING 14" - 16"wc SET POINT
	15.27" - 24.11"wc	WHITE SPRING 17" - 18"wc SET POINT
3" NORVAL 630Ø HEAD	8.43" - 14.46"wc	WHITE SPRING 10" - 13"wc SET POINT
	11.25" - 19.28"wc	YELLOW SPRING 14" - 18"wc SET POINT
4" NORVAL 630Ø HEAD	8.84" - 14.86"wc	WHITE SPRING 10" - 13"wc SET POINT
	12.05" - 20.09"wc	YELLOW SPRING 14" - 18"wc SET POINT

DESIGN DATA (EXCLUDING REGS)		
DESIGN FACTOR	0.4	REF. CFR 192.111
DESIGN PRESSURE	275 PSIG	>= INLET MAOP
% SMYS AT DESIGN PRESSURE	7.46%	% SMYS BASED ON: 4", 0.237" w, GR. B.
MIN. TEST PRESSURE	413 PSIG	(1.5 X DESIGN PRESSURE)
MAX. TEST PRESSURE	450 PSIG	(PER ANSI B16.5)
MIN. TEST DURATION	FIELD DET.	(PER GS 1500.010)
% SMYS AT MIN. PRESSURE TEST	11.20%	% SMYS BASED ON: 4", 0.237" w, GR. B.
% SMYS AT MAX. PRESSURE TEST	12.21%	% SMYS BASED ON: 4", 0.237" w, GR. B.
% SMYS AT MAOP	7.46%	% SMYS BASED ON: 4", 0.237" w, GR. B.
MAOP LIMITING ELEMENT	PRESSURE TEST OR LOWEST FITTING MWP	
TEST MEDIUM	NITROGEN/AIR	
% X-RAY	PER GAS STANDARDS	

DESIGN NOTE

1. %SMYS BASED OFF NEWLY INSTALLED EQUIPMENT
2. EXISTING EQUIPMENT %SYMS TO BE CALCULATED BY OTHERS
3. MAOP LIMITING ELEMENT BASED OFF OF NEWLY INSTALLED EQUIPMENT



MINIMUM 5 CONTROL LINE PORTS REQUIRED FOR NORVAL MONITOR/SENSUS CONTROL  
 CONTROL LINE PORTS TO BE INSTALLED IN 10 O'CLOCK AND 2 O'CLOCK POSITION  
 SEE SUPPLEMENTAL CONTROL DRAWING FOR CONTROL LINE DETAILS

**4" x 2" x 4" TOPWORKS REPLACEMENT -- TYPICAL**  
 1"=20"

**\*\*NOTE\*\* TOTAL STATION SHUT DOWN IS RECOMMENDED BEFORE COMMENCING WORK**

	DATE	10/11/18	DRAWING TITLE	4" X 4" TOPWORKS REPLACEMENT WITH 2" REGS - TYPICAL
	DATE	10/19/18	ELEVATION VIEW	
	SCALE	AS NOTED	PROJECT TITLE	NISOURCE LP STATION INITIATIVE
	CITY/COUNTY	####	PROJECT DRAWING	LP STATION DRAWING
STATE	####	PROJECT ID	FT-040204-150	PAGE NO. 1 OF 1

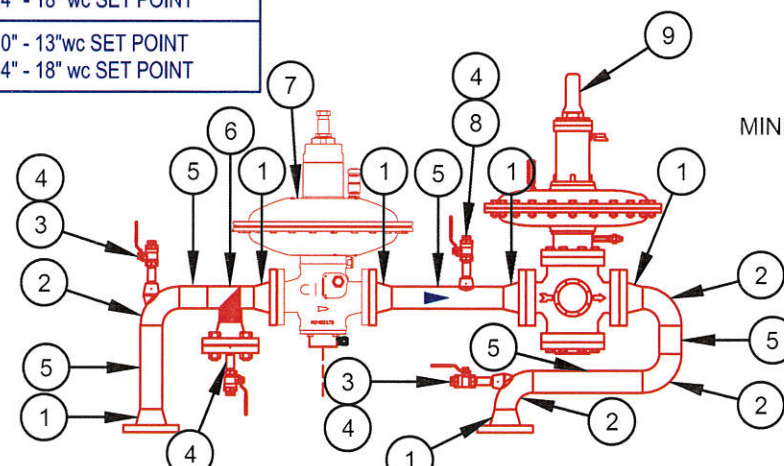
JOB NO. \_\_\_\_\_ BILL OF MATERIAL DWG. 1 OF 1

NO.	DATE	DRAWN	APPROVED	REVISION DESCRIPTION
C	2/13/19	TLATTA	GSMILLER	MODIFIED DESIGN BLOCK

STOCK NO.	ITEM	QTY.	SIZE	DESCRIPTION
19-65-021	1	6	2"	FLG WELD NECK, FF, ANSI 150, F.S., BORED TO 0.154" WALL; 4 BOLTS PER FLANGE
28-46-406	32		5/8" x 3"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0321	8		2"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
17-15-095	2	4	2"	ELL, WELDING, 90 DEG., L.R., GRADE B, 0.154" WALL
17-86-013	3	2	1/2"	ELBOLET, FOR 3/4" THROUGH 36" PIPE, 3000 #, C.S.
24-04-230	4	4	1/2" x 3"	XH NIPPLE, GB, SMLS, CS A106, TBE
16-05-131	4	4	1/2"	VALVE, BALL, R.P., THREADED, SS, S8000-M3, 2000# W.O.G.
26-58-420	4	4	1/2"	PLUG, HEX HEAD, XH CS, 6000#, SA105
07-52-0200	5	4' (MIN.)	2"	PIPE, P.E., 0.154" STD WALL, X-52, BARE, C.S., ERW, API5L
48-99-050	6	1	2"	STRAINER, APOLLO, 02-TSW-275, 150#, CS GB, WLD X WLD, STR0022 W/100 MESH LINER
SPEC. ORDER	7	1	2"	REGULATOR, MONITOR, PIETRO FIORINTINI, NORVAL, 495Ø HEAD, DUCTILE IRON BODY, SEE TABLE 1 FOR MONITOR SPRING & SET POINTS. W/ ER MONITOR, W/ ON-BOARD SLAM SHUT, SLAM SHUT MODEL SN-91, RED/BLACK OPSO SPRING SET TO 20" w.c., (12" w.c. - 1.06 PSIG RANGE), WHITE UPSO SPRING SET TO 4" w.c., (4" w.c. - 9.2" w.c. RANGE), ANSI 150, 275# WP, MONITOR POSITION, FIELD ADJUST SET PT.
17-88-028	8	1	1/2"	THREDOLET, FOR 2" THROUGH 2-1/2" PIPE, 3000 #, C.S.
SPEC. ORDER	9	1	2"	REGULATOR, CONTROL, 441/461 OR MOONEY, ANSI-125/150
19-14-011	T1	2	2"	FLANGE, BLIND, ANSI 150, F.F., CS, SA105; 4 BOLTS PER FLANGE
28-46-406	12		5/8" x 3"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0321	4		2"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
SPEC. ORDER	G1	AS NEEDED	2" 5/8" x 3-3/4"	GASKET, STRAINER, MFG VSP, TORQ-KIT, ANSI-150, 316SS MESH SCREEN, WITH STUDS AND NUTS STUD BOLT, A193 B7, XYLAN COATED WITH 2 XYLAN COATED NUTS

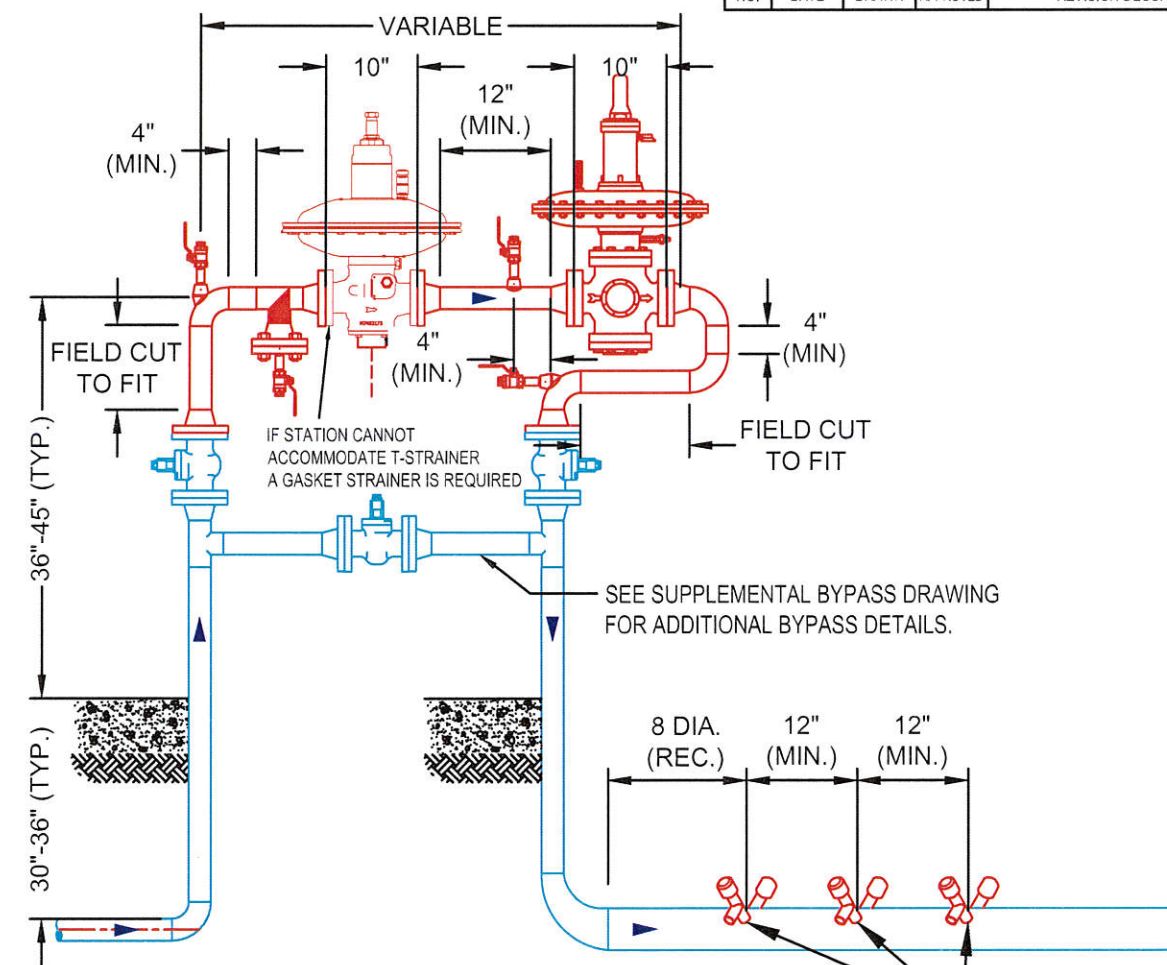
TABLE 1

REGULATOR SIZE	AVAILABLE SPRING RANGE	RECOMMENDED SET POINTS
2" NORVAL 495Ø HEAD	10.04" - 14.06"wc	BLACK SPRING
	12.45" - 16.87"wc	BLUE SPRING
	15.27" - 24.11"wc	WHITE SPRING
3" NORVAL 630Ø HEAD	8.43" - 14.46"wc	WHITE SPRING
	11.25" - 19.28"wc	YELLOW SPRING
4" NORVAL 630Ø HEAD	8.84" - 14.86"wc	WHITE SPRING
	12.05" - 20.09"wc	YELLOW SPRING



2" x 2" GOOSENECK DESIGN -- TYPICAL

DIAMETERS TO BE CALCULATED OFF TAPPING PIPE SIZE  
 MINIMUM 5 CONTROL LINE PORTS REQUIRED FOR NORVAL MONITOR/SENSUS CONTROL  
 CONTROL LINE PORTS TO BE INSTALLED IN 10 O'CLOCK AND 2 O'CLOCK POSITION  
 SEE SUPPLEMENTAL CONTROL DRAWING FOR CONTROL LINE DETAILS



2" x 2" GOOSENECK TOPWORKS -- TYPICAL  
 1"=20"

**\*\*NOTE\*\* TOTAL STATION SHUT DOWN IS RECOMMENDED BEFORE COMMENCING WORK**

DESIGN NOTE

1. %SMYS BASED OFF NEWLY INSTALLED EQUIPMENT
2. EXISTING EQUIPMENT %SYMS TO BE CALCULATED BY OTHERS
3. MAOP LIMITING ELEMENT BASED OFF OF NEWLY INSTALLED EQUIPMENT

DESIGN DATA (EXCLUDING REGS)		
DESIGN FACTOR	0.4	REF. CFR 192.111
DESIGN PRESSURE	275 PSIG	>= INLET MAOP
% SMYS AT DESIGN PRESSURE	6.06%	% SMYS BASED ON: 2", 0.154" w, GR. B
MIN. TEST PRESSURE	413 PSIG	(1.5 X DESIGN PRESSURE)
MAX. TEST PRESSURE	450 PSIG	(PER ANSI B16.5)
MIN. TEST DURATION	FIELD DET.	(PER GS 1500.010)
% SMYS AT MIN. PRESSURE TEST	9.10%	% SMYS BASED ON: 2", 0.154" w, GR. B
% SMYS AT MAX. PRESSURE TEST	9.91%	% SMYS BASED ON: 2", 0.154" w, GR. B
% SMYS AT MAOP	6.06%	% SMYS BASED ON: 2", 0.154" w, GR. B
MAOP LIMITING ELEMENT	PRESSURE TEST OR LOWEST FITTING MWP	
TEST MEDIUM	NITROGEN/AIR	
% X-RAY	PER GAS STANDARDS	

<b>NISource</b> Energy Distribution	DATE	10/11/18	DRAWING TITLE	2" x 2" GOOSENECK WITH 2" REGS - TYPICAL
	DRAWN	TLATTA	ELEVATION VIEW	
	CHECKED	G.S MILLER	PROJECT TITLE	NISOURCE LP STATION INITIATIVE
	SCALE	AS NOTED	LP STATION DRAWING	
CITY/COUNTY	STATE	PROJECT ID	GN-020202-150	PAGE NO. 1 OF 1

JOB NO. \_\_\_\_\_ BILL OF MATERIAL DWG. 1 OF 1

STOCK NO.	ITEM	QTY.	SIZE	DESCRIPTION
19-65-021	1	4	2"	FLG WELD NECK, FF, ANSI 150, F.S., BORED TO 0.154" WALL; 4 BOLTS PER FLANGE
28-46-406	24		5/8" x 3"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0321	6		2"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
17-15-095	2	2	2"	ELL, WELDING, 90 DEG., L.R., GRADE B, 0.154" WALL
17-86-013	3	2	1/2"	ELBOLET, FOR 3/4" THROUGH 36" PIPE, 3000 #, C.S.
24-04-230	4	4	1/2" x 3"	XH NIPPLE, GB, SMLS, CS A106, TBE
16-05-131	4	4	1/2"	VALVE, BALL, R.P., THREADED, SS, S8000-M3, 2000# W.O.G.
26-58-420	4	4	1/2"	PLUG, HEX HEAD, XH CS, 6000#, SA105
07-52-0200	5	3' (MIN.)	2"	PIPE, P.E., 0.154" STD WALL, X-52, BARE, C.S., ERW, API5L
48-99-050	6	1	2"	STRAINER, APOLLO, 02-TSW-275, 150#, CS GB, WLD X WLD, STR0022 W/100 MESH LINER
SPEC. ORDER	7	1	2"	REGULATOR, MONITOR, PIETRO FIORINTINI, NORVAL, 4950 HEAD, DUCTILE IRON BODY, SEE TABLE 1 FOR MONITOR SPRING & SET POINTS, W/ ER MONITOR, W/ ON-BOARD SLAM SHUT, SLAM SHUT MODEL SN-91, RED/BLACK OPSO SPRING SET TO 20" w.c., (12" w.c. - 1.06 PSIG RANGE), WHITE UPSO SPRING SET TO 4" w.c., (4" w.c. - 9.2" w.c. RANGE), ANSI 150, 275# WP, MONITOR POSITION, FIELD ADJUST SET PT.
17-88-028	8	1	1/2"	THREDOLET, FOR 2" THROUGH 2-1/2" PIPE, 3000 #, C.S.
SPEC. ORDER	9	1	2"	REGULATOR, CONTROL, 441/461 OR MOONEY, ANSI-125/150
19-65-032	10	2	3"	FLG WELD NECK, FF, ANSI 150, F.S., BORED TO 0.216" WALL; 4 BOLTS PER FLANGE
28-46-408	8		5/8" x 3-1/2"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0441	2		3"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
17-26-106	11	2	3" x 2"	ELL, REDUCING, GRADE B, 0.216" x 0.154" WALL
07-52-0300	12	2' (MIN)	3"	PIPE, P.E., 0.216" STD WALL, X-52, BARE, C.S., ERW, API5L
19-14-015	T1	2	3"	FLANGE, BLIND, ANSI 150, F.F., CS, SA105; 4 BOLTS PER FLANGE
28-46-408	12		5/8" x 3-1/2"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0441	4		3"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
SPEC. ORDER	G1	AS NEEDED	2" 5/8" x 3-3/4"	GASKET, STRAINER, MFG VSP, TORQ-KIT, ANSI-150, 316SS MESH SCREEN, WITH STUDS AND NUTS STUD BOLT, A193 B7, XLAN COATED WITH 2 XLAN COATED NUTS

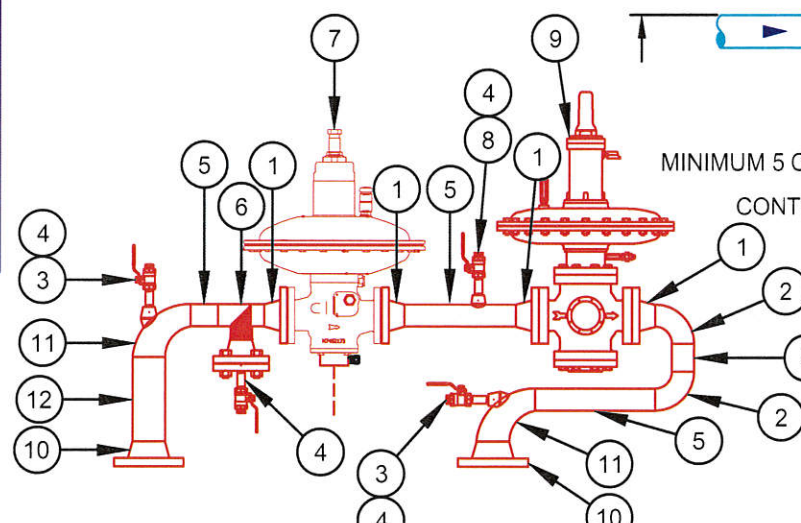
TABLE 1

REGULATOR SIZE	AVAILABLE SPRING RANGE	RECOMMENDED SET POINTS
2" NORVAL 4950 HEAD	10.04" - 14.06"wc	BLACK SPRING
	12.45" - 16.87"wc	BLUE SPRING
	15.27" - 24.11"wc	WHITE SPRING
3" NORVAL 6300 HEAD	8.43" - 14.46"wc	WHITE SPRING
	11.25" - 19.28"wc	YELLOW SPRING
4" NORVAL 6300 HEAD	8.84" - 14.86"wc	WHITE SPRING
	12.05" - 20.09"wc	YELLOW SPRING

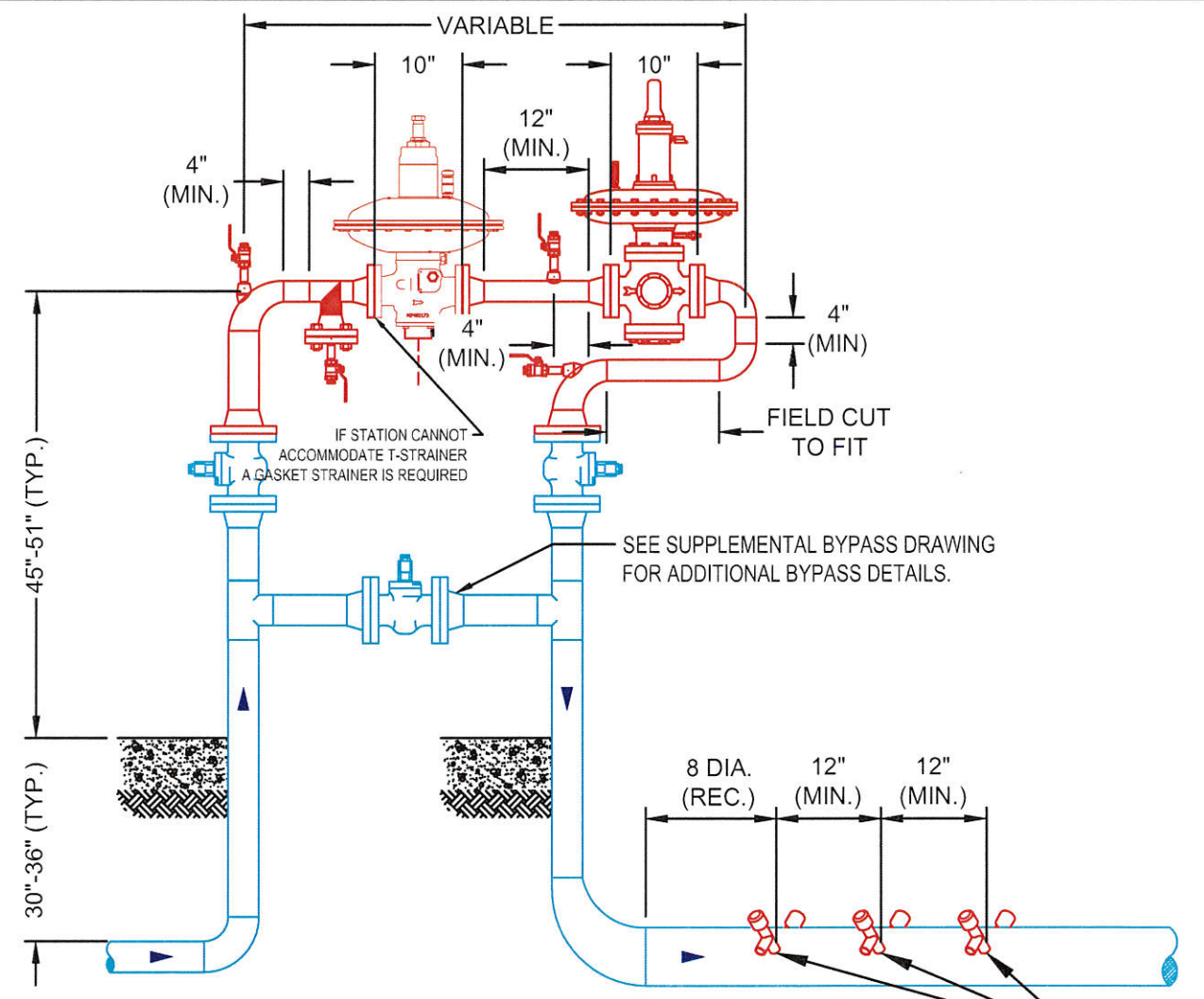
DESIGN DATA (EXCLUDING REGS)	
DESIGN FACTOR	0.4 REF. CFR 192.111
DESIGN PRESSURE	275 PSIG >= INLET MAOP
% SMYS AT DESIGN PRESSURE	6.37% % SMYS BASED ON: 3", 0.216" w, GR. B
MIN. TEST PRESSURE	413 PSIG (1.5 X DESIGN PRESSURE)
MAX. TEST PRESSURE	450 PSIG (PER ANSI B16.5)
MIN. TEST DURATION	FIELD DET. (PER GS 1500.010)
% SMYS AT MIN. PRESSURE TEST	9.56% % SMYS BASED ON: 3", 0.216" w, GR. B
% SMYS AT MAX. PRESSURE TEST	10.42% % SMYS BASED ON: 3", 0.216" w, GR. B
% SMYS AT MAOP	6.37% % SMYS BASED ON: 3", 0.216" w, GR. B
MAOP LIMITING ELEMENT	PRESSURE TEST OR LOWEST FITTING MWP
TEST MEDIUM	NITROGEN/AIR
% X-RAY	PER GAS STANDARDS

DESIGN NOTE

1. %SMYS BASED OFF NEWLY INSTALLED EQUIPMENT
2. EXISTING EQUIPMENT %SYMS TO BE CALCULATED BY OTHERS
3. MAOP LIMITING ELEMENT BASED OFF OF NEWLY INSTALLED EQUIPMENT



3" x 2" x 3" GOOSENECK DESIGN -- TYPICAL



DIAMETERS TO BE CALCULATED OFF TAPPING PIPE SIZE

MINIMUM 5 CONTROL LINE PORTS REQUIRED FOR NORVAL MONITOR/SENSUS CONTROL  
 CONTROL LINE PORTS TO BE INSTALLED IN 10 O'CLOCK AND 2 O'CLOCK POSITION  
 SEE SUPPLEMENTAL CONTROL DRAWING FOR CONTROL LINE DETAILS

3" x 2" x 3" GOOSENECK TOPWORKS -- TYPICAL  
 1"=20"

**\*\*NOTE\*\* TOTAL STATION SHUT DOWN IS RECOMMENDED BEFORE COMMENCING WORK**

C	2/13/19	TLATTA	GSMILLER	MODIFIED DESIGN BLOCK
NO.	DATE	DRAWN	APPROVED	REVISION DESCRIPTION

	DRAWN: TLATTA DATE: 10/11/18 CHECKED: G.S MILLER DATE: 10/19/18	DRAWING TITLE: 3" x 3" GOOSENECK WITH 2" REGS - TYPICAL ELEVATION VIEW
	SCALE: AS NOTED	PROJECT TITLE: NISOURCE LP STATION INITIATIVE LP STATION DRAWING
	CITY/COUNTY: ##### STATE: #####	PROJECT #: GN-030203-150
	SIZE: L	PAGE NO: 1 OF 1

JOB NO. \_\_\_\_\_ BILL OF MATERIAL DWG. 1 OF 1

STOCK NO.	ITEM	QTY.	SIZE	DESCRIPTION
19-65-021	1	4	2"	FLG WELD NECK, FF, ANSI 150, F.S., BORED TO 0.154" WALL; 4 BOLTS PER FLANGE
28-46-406	24		5/8" x 3"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0321	6		2"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
17-15-095	2	2	2"	ELL, WELDING, 90 DEG., L.R., GRADE B, 0.154" WALL
17-86-013	3	2	1/2"	ELBOLET, FOR 3/4" THROUGH 36" PIPE, 3000 #, C.S.
24-04-230	4	4	1/2" x 3"	XH NIPPLE, GB, SMLS, CS A106, TBE
16-05-131	4	4	1/2"	VALVE, BALL, R.P., THREADED, SS, S8000-M3, 2000# W.O.G.
26-58-420	4	4	1/2"	PLUG, HEX HEAD, XH CS, 6000#, SA105
07-52-0200	5	3' (MIN.)	2"	PIPE, P.E., 0.154" STD WALL, X-52, BARE, C.S., ERW, API5L
48-99-050	6	1	2"	STRAINER, APOLLO, 02-TSW-275, 150#, CS GB, WLD X WLD, STR0022 W/100 MESH LINER
SPEC. ORDER	7	1	2"	REGULATOR, MONITOR, PIETRO FIORINTINI, NORVAL, 495Ø HEAD, DUCTILE IRON BODY, SEE TABLE 1 FOR MONITOR SPRING & SET POINTS. W/ ER MONITOR, W/ ON-BOARD SLAM SHUT, SLAM SHUT MODEL SN-91, RED/BLACK OPSO SPRING SET TO 20" w.c., (12" w.c. - 1.06 PSIG RANGE), WHITE UPSO SPRING SET TO 4" w.c., (4" w.c. - 9.2" w.c. RANGE), ANSI 150, 275# WP, MONITOR POSITION, FIELD ADJUST SET PT.
17-88-028	8	1	1/2"	THREDOLET, FOR 2" THROUGH 2-1/2" PIPE, 3000 #, C.S.
SPEC. ORDER	9	1	2"	REGULATOR, CONTROL, 441/461 OR MOONEY, ANSI-125/150
19-65-032	10	1	3"	FLG WELD NECK, FF, ANSI 150, F.S., BORED TO 0.216" WALL; 4 BOLTS PER FLANGE
28-46-408	4		5/8" x 3-1/2"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0441	1		3"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
19-65-048	11	1	4"	FLG WELD NECK, FF, ANSI 150, F.S., BORED TO 0.237" WALL; 8 BOLTS PER FLANGE
28-46-408	8		5/8" x 3-1/2"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0561	1		4"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
17-26-106	12	1	3" x 2"	ELL, REDUCING, GRADE B, 0.216" x 0.154" WALL
17-26-160	13	1	4" x 2"	ELL, REDUCING, GRADE B, 0.237" x 0.154" WALL
07-52-0300	14	2' (MIN.)	3"	PIPE, P.E., 0.216" STD WALL, X-52, BARE, C.S., ERW, API5L
19-14-015	T1	1	3"	FLANGE, BLIND, ANSI 150, F.F., CS, SA105; 4 BOLTS PER FLANGE
28-46-408	8		5/8" x 3-1/2"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0441	3		3"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
19-14-019	T2	1	4"	FLANGE, BLIND, ANSI 150, F.F., CS, SA105; 8 BOLTS PER FLANGE
28-46-408	16		5/8" x 3-1/2"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0561	3		4"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
SPEC. ORDER	G1	AS NEEDED	2"	GASKET, STRAINER, MFG VSP, TORQ-KIT, ANSI-150, 316SS MESH SCREEN, WITH STUDS AND NUTS
			5/8" x 3-3/4"	STUD BOLT, A193 B7, XYLAN COATED WITH 2 XYLAN COATED NUTS

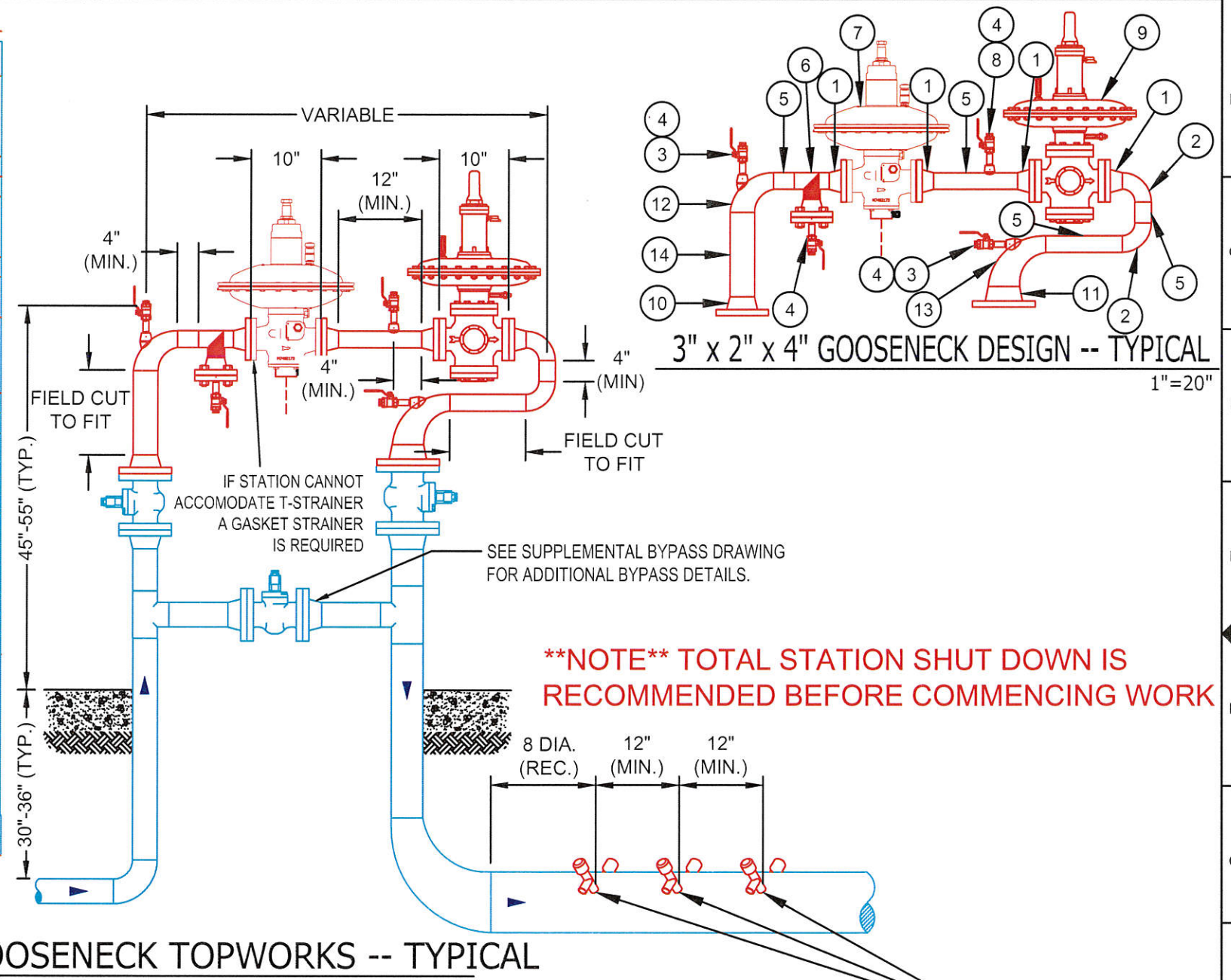
DESIGN NOTE

1. %SMYS BASED OFF NEWLY INSTALLED EQUIPMENT
2. EXISTING EQUIPMENT %SYMS TO BE CALCULATED BY OTHERS
3. MAOP LIMITING ELEMENT BASED OFF OF NEWLY INSTALLED EQUIPMENT

DESIGN DATA (EXCLUDING REGS)		
DESIGN FACTOR	0.4	REF. CFR 192.111
DESIGN PRESSURE	275 PSIG	>= INLET MAOP
% SMYS AT DESIGN PRESSURE	7.46%	% SMYS BASED ON: 4", 0.237" w, GR. B.
MIN. TEST PRESSURE	413 PSIG	(1.5 X DESIGN PRESSURE)
MAX. TEST PRESSURE	450 PSIG	(PER ANSI B16.5)
MIN. TEST DURATION	FIELD DET.	(PER GS 1500.010)
% SMYS AT MIN. PRESSURE TEST	11.20%	% SMYS BASED ON: 4", 0.237" w, GR. B.
% SMYS AT MAX. PRESSURE TEST	12.21%	% SMYS BASED ON: 4", 0.237" w, GR. B.
% SMYS AT MAOP	7.46%	% SMYS BASED ON: 4", 0.237" w, GR. B.
MAOP LIMITING ELEMENT	PRESSURE TEST OR LOWEST FITTING MWVP	
TEST MEDIUM	NITROGEN/AIR	
% X-RAY	PER GAS STANDARDS	

TABLE 1

REGULATOR SIZE	AVAILABLE SPRING RANGE	RECOMMENDED SET POINTS
2" NORVAL 495Ø HEAD	10.04" - 14.06"wc 12.45" - 16.87"wc 15.27" - 24.11"wc	BLACK SPRING BLUE SPRING WHITE SPRING
3" NORVAL 630Ø HEAD	8.43" - 14.46"wc 11.25" - 19.28"wc	WHITE SPRING YELLOW SPRING
4" NORVAL 630Ø HEAD	8.84" - 14.86"wc 12.05" - 20.09"wc	WHITE SPRING YELLOW SPRING



**\*\*NOTE\*\* TOTAL STATION SHUT DOWN IS RECOMMENDED BEFORE COMMENCING WORK**

MINIMUM 5 CONTROL LINE PORTS REQUIRED FOR NORVAL MONITOR/SENSUS CONTROL  
 CONTROL LINE PORTS TO BE INSTALLED IN 10 O'CLOCK AND 2 O'CLOCK POSITION  
 SEE SUPPLEMENTAL CONTROL DRAWING FOR CONTROL LINE DETAILS

	DRAWN: TLATTA DATE: 10/11/18 DWG CHECKED: G.S MILLER DATE: 10/19/18	DRAWING TITLE: 3" x 4" GOOSENECK WITH 2" REGS - TYPICAL ELEVATION VIEW
	SCALE: AS NOTED	PROJECT TITLE: NISOURCE LP STATION INITIATIVE LP STATION DRAWING
	CITY/COUNTY: ##### STATE: #####	PROJECT ID: GN-030204-150 PAGE NO: 1 OF 1
	REVISION DESCRIPTION:	REVISION:

C	2/13/19	TLATTA	GSMILLER	MODIFIED DESIGN BLOCK
NO.	DATE	DRAWN	APPROVED	REVISION DESCRIPTION

JOB NO. \_\_\_\_\_

BILL OF MATERIAL

DWG. 1 OF 1

STOCK NO.	ITEM	QTY.	SIZE	DESCRIPTION
19-65-032	1	6	3"	FLG WELD NECK, FF, ANSI 150, F.S., BORED TO 0.216" WALL; 4 BOLTS PER FLANGE
28-46-408	32		5/8" x 3-1/2"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0441	8		3"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
17-15-127	2	4	3"	ELL, WELDING, 90 DEG., L.R., GRADE B, 0.216" WALL
17-86-013	3	2	1/2"	ELBOLET, FOR 3/4" THROUGH 36" PIPE, 3000 #, C.S.
24-04-230	4	4	1/2" x 3"	XH NIPPLE, GB, SMLS, CS A106, TBE
16-05-131	4	4	1/2"	VALVE, BALL, R.P., THREADED, SS, S8000-M3, 2000# W.O.G.
26-58-420	4	4	1/2"	PLUG, HEX HEAD, XH CS, 6000#, SA105
07-52-0300	5	4' (MIN.)	3"	PIPE, P.E., 0.216" STD WALL, X-52, BARE, C.S., ERW, API5L
48-99-051	6	1	3"	STRAINER, APOLLO, 03-TSW-275, 150#, CS GB, WLD X WLD, STR0022 W/100 MESH LINER
SPEC. ORDER	7	1	3"	REGULATOR, MONITOR, PIETRO FIORINTINI, NORVAL, 6300 HEAD, DUCTILE IRON BODY, SEE TABLE 1 FOR MONITOR SPRING & SET POINTS, W/ ER MONITOR, W/ ON-BOARD SLAM SHUT, SLAM SHUT MODEL SN-91, RED/BLACK OPSO SPRING SET TO 20" w.c. (12" w.c. - 1.06 PSIG RANGE), WHITE UPSO SPRING SET TO 4" w.c. (4" w.c. - 9.2" w.c. RANGE), ANSI 150, 275# WP, MONITOR POSITION, FIELD ADJUST SET POINT
17-88-030	8	1	1/2"	THREDOLET, FOR 3" THROUGH 8" PIPE, 3000 #, C.S.
SPEC. ORDER	9	1	3"	REGULATOR, CONTROL, 441 OR MOONEY, ANSI-125/150
19-14-015	T1	2	3"	FLANGE, BLIND, ANSI 150, F.F., CS, SA105; 4 BOLTS PER FLANGE
28-46-408	12		5/8" x 3-1/2"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0441	4		3"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
SPEC. ORDER	G1	AS NEEDED	3" 5/8" x 4"	GASKET, STRAINER, MFG VSP, TORQ-KIT, ANSI-150, 316SS MESH SCREEN, WITH STUDS AND NUTS STUD BOLT, A193 B7, XYLAN COATED WITH 2 XYLAN COATED NUTS

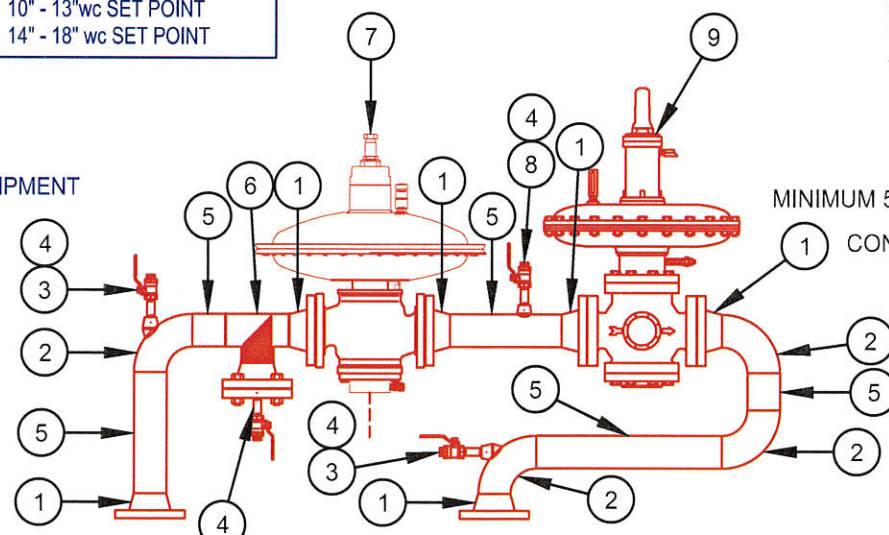
TABLE 1

REGULATOR SIZE	AVAILABLE SPRING RANGE	RECOMMENDED SET POINTS
2" NORVAL 495Ø HEAD	10.04" - 14.06"wc	BLACK SPRING
	12.45" - 16.87"wc	BLUE SPRING
	15.27" - 24.11"wc	WHITE SPRING
3" NORVAL 630Ø HEAD	8.43" - 14.46"wc	WHITE SPRING
	11.25" - 19.28"wc	YELLOW SPRING
4" NORVAL 630Ø HEAD	8.84" - 14.86"wc	WHITE SPRING
	12.05" - 20.09"wc	YELLOW SPRING

DESIGN NOTE

1. %SMYS BASED OFF NEWLY INSTALLED EQUIPMENT
2. EXISTING EQUIPMENT %SYMS TO BE CALCULATED BY OTHERS
3. MAOP LIMITING ELEMENT BASED OFF OF NEWLY INSTALLED EQUIPMENT

DESIGN DATA (EXCLUDING REGS)		
DESIGN FACTOR	0.4	REF. CFR 192.111
DESIGN PRESSURE	275 PSIG	>= INLET MAOP
% SMYS AT DESIGN PRESSURE	6.37%	% SMYS BASED ON: 3", 0.216" w, GR. B
MIN. TEST PRESSURE	413 PSIG	(1.5 X DESIGN PRESSURE)
MAX. TEST PRESSURE	450 PSIG	(PER ANSI B16.5)
MIN. TEST DURATION	FIELD DET.	(PER GS 1500.010)
% SMYS AT MIN. PRESSURE TEST	9.56%	% SMYS BASED ON: 3", 0.216" w, GR. B
% SMYS AT MAX. PRESSURE TEST	10.42%	% SMYS BASED ON: 3", 0.216" w, GR. B
% SMYS AT MAOP	6.37%	% SMYS BASED ON: 3", 0.216" w, GR. B
MAOP LIMITING ELEMENT	PRESSURE TEST OR LOWEST FITTING MWP	
TEST MEDIUM	NITROGEN/AIR	
% X-RAY	PER GAS STANDARDS	

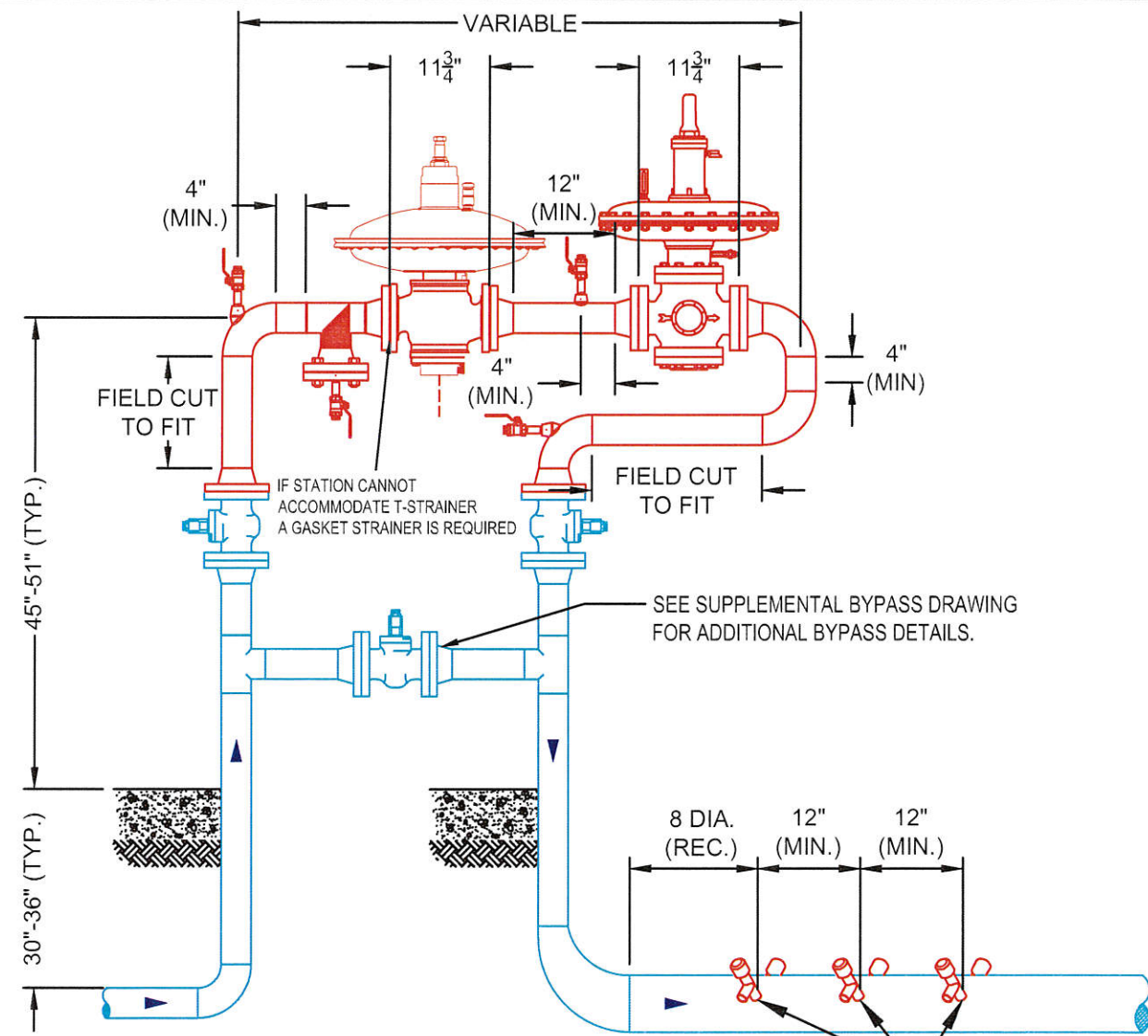


3" x 3" GOOSENECK DESIGN -- TYPICAL

MINIMUM 5 CONTROL LINE PORTS REQUIRED FOR NORVAL MONITOR/SENSUS CONTROL  
 CONTROL LINE PORTS TO BE INSTALLED IN 10 O'CLOCK AND 2 O'CLOCK POSITION  
 SEE SUPPLEMENTAL CONTROL DRAWING FOR CONTROL LINE DETAILS

3" x 3" GOOSENECK TOPWORKS -- TYPICAL

\*\*NOTE\*\* TOTAL STATION SHUT DOWN IS RECOMMENDED BEFORE COMMENCING WORK



DIAMETERS TO BE CALCULATED OFF TAPPING PIPE SIZE

C	NO.	DATE	DRAWN	APPROVED	REVISION DESCRIPTION
2/13/19	TLATA	GSMILLER	MODIFIED DESIGN BLOCK		

	DRAWN: TLATA DATE: 10/11/18 DESIGNED: G.S MILLER DATE: 10/19/18 SCALE: AS NOTED CITY/COUNTY: #### STATE: ####	DRAWING TITLE: 3" x 3" GOOSENECK WITH 3" REGS - TYPICAL ELEVATION VIEW PROJECT TITLE: NISOURCE LP STATION INITIATIVE LP STATION DRAWING PROJECT # : GN-030303-150 PAGE NO: 1 OF 1
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JOB NO. \_\_\_\_\_ BILL OF MATERIAL DWG. 1 OF 1

STOCK NO.	ITEM	QTY.	SIZE	DESCRIPTION
19-65-021	1	4	2"	FLG WELD NECK, FF, ANSI 150, F.S., BORED TO 0.154" WALL; 4 BOLTS PER FLANGE
28-46-406		24	5/8" x 3"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0321		6	2"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
17-15-095	2	2	2"	ELL, WELDING, 90 DEG., L.R., GRADE B, 0.154" WALL
17-86-013	3	2	1/2"	ELBOLET, FOR 3/4" THROUGH 36" PIPE, 3000 #, C.S.
24-04-230	4	4	1/2" x 3"	XH NIPPLE, GB, SMLS, CS A106, TBE
16-05-131		4	1/2"	VALVE, BALL, R.P., THREADED, SS, S8000-M3, 2000# W.O.G.
26-58-420		4	1/2"	PLUG, HEX HEAD, XH CS, 6000#, SA105
07-52-0200	5	3' (MIN.)	2"	PIPE, P.E., 0.154" STD WALL, X-52, BARE, C.S., ERW, API5L
48-99-050	6	1	2"	STRAINER, APOLLO, 02-TSW-275, 150#, CS GB, WLD X WLD, STR0022 W/100 MESH LINER
SPEC. ORDER	7	1	2"	REGULATOR, MONITOR, PIETRO FIORINTINI, NORVAL, 4950 HEAD, DUCTILE IRON BODY, SEE TABLE 1 FOR MONITOR SPRING & SET POINTS. W/ ER MONITOR, W/ ON-BOARD SLAM SHUT, SLAM SHUT MODEL SN-91, RED/BLACK OPSO SPRING SET TO 20" w.c., (12" w.c. - 1.06 PSIG RANGE), WHITE UPSO SPRING SET TO 4" w.c., (4" w.c. - 9.2" w.c. RANGE), ANSI 150, 275# WP, MONITOR POSITION, FIELD ADJUST SET PT.
17-88-028	8	1	1/2"	THREDOLET, FOR 2" THROUGH 2-1/2" PIPE, 3000 #, C.S.
SPEC. ORDER	9	1	2"	REGULATOR, CONTROL, 441/461 OR MOONEY, ANSI-125/150
19-65-048	10	2	4"	FLG WELD NECK, FF, ANSI 150, F.S., BORED TO 0.237" WALL; 8 BOLTS PER FLANGE
28-46-408		16	5/8" x 3-1/2"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0561		2	4"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
17-26-160	11	2	4" x 2"	ELL, REDUCING, GRADE B, 0.237" x 0.154" WALL
07-52-0400	12	2' (MIN.)	4"	PIPE, P.E., 0.237" STD WALL, X-52, BARE, C.S., ERW, API5L
19-14-019	T1	2	4"	FLANGE, BLIND, ANSI 150, F.F., CS, SA105; 8 BOLTS PER FLANGE
28-46-408		24	5/8" x 3-1/2"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0561		4	4"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
SPEC. ORDER	G1	AS NEEDED	2" 5/8" x 3-3/4"	GASKET, STRAINER, MFG VSP, TORQ-KIT, ANSI-150, 316SS MESH SCREEN, WITH STUDS AND NUTS STUD BOLT, A193 B7, XYLAN COATED WITH 2 XYLAN COATED NUTS

TABLE 1

REGULATOR SIZE	AVAILABLE SPRING RANGE	RECOMMENDED SET POINTS
2" NORVAL 4950 HEAD	10.04" - 14.06"wc	BLACK SPRING 10" - 13"wc SET POINT
	12.45" - 16.87"wc	BLUE SPRING 14" - 16" wc SET POINT
	15.27" - 24.11"wc	WHITE SPRING 17" - 18" wc SET POINT
3" NORVAL 6300 HEAD	8.43" - 14.46"wc	WHITE SPRING 10" - 13"wc SET POINT
	11.25" - 19.28"wc	YELLOW SPRING 14" - 18" wc SET POINT
4" NORVAL 6300 HEAD	8.84" - 14.86"wc	WHITE SPRING 10" - 13"wc SET POINT
	12.05" - 20.09"wc	YELLOW SPRING 14" - 18"wc SET POINT

DESIGN DATA (EXCLUDING REGS)		
DESIGN FACTOR	0.4	REF. CFR 192.111
DESIGN PRESSURE	275 PSIG	>= INLET MAOP
% SMYS AT DESIGN PRESSURE	7.46%	% SMYS BASED ON: 4", 0.237" w, GR. B.
MIN. TEST PRESSURE	413 PSIG	(1.5 X DESIGN PRESSURE)
MAX. TEST PRESSURE	450 PSIG	(PER ANSI B16.5)
MIN. TEST DURATION	FIELD DET.	(PER GS 1500.010)
% SMYS AT MIN. PRESSURE TEST	11.20%	% SMYS BASED ON: 4", 0.237" w, GR. B.
% SMYS AT MAX. PRESSURE TEST	12.21%	% SMYS BASED ON: 4", 0.237" w, GR. B.
% SMYS AT MAOP	7.46%	% SMYS BASED ON: 4", 0.237" w, GR. B.
MAOP LIMITING ELEMENT	PRESSURE TEST OR LOWEST FITTING MWP	
TEST MEDIUM	NITROGEN/AIR	
% X-RAY	PER GAS STANDARDS	

**\*\*NOTE\*\* TOTAL STATION SHUT DOWN IS RECOMMENDED BEFORE COMMENCING WORK**

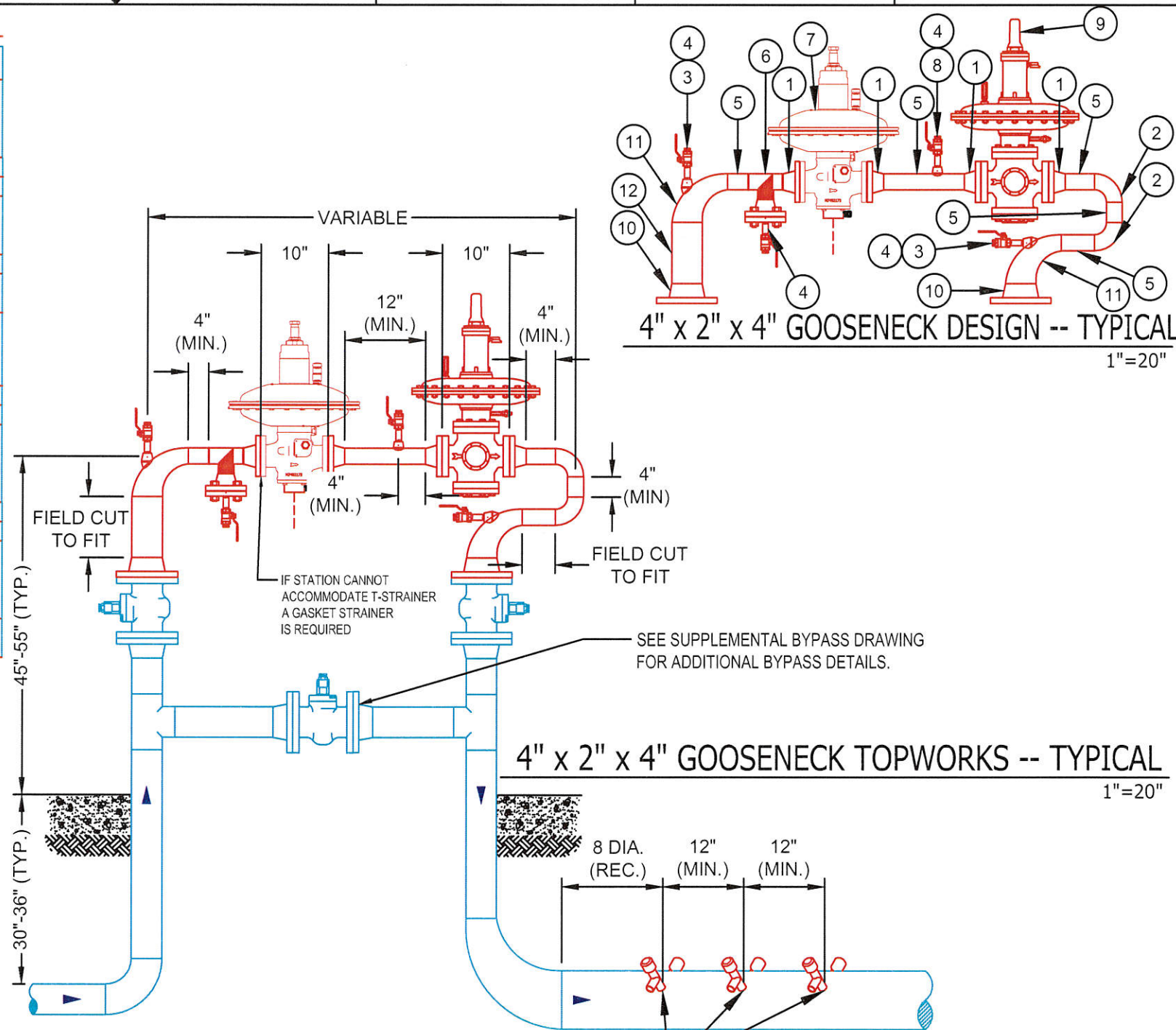
DESIGN NOTE

1. %SMYS BASED OFF NEWLY INSTALLED EQUIPMENT
2. EXISTING EQUIPMENT %SYMS TO BE CALCULATED BY OTHERS
3. MAOP LIMITING ELEMENT BASED OFF OF NEWLY INSTALLED EQUIPMENT

MINIMUM 5 CONTROL LINE PORTS REQUIRED FOR NORVAL MONITOR/SENSUS CONTROL

CONTROL LINE PORTS TO BE INSTALLED IN 10 O'CLOCK AND 2 O'CLOCK POSITION

SEE SUPPLEMENTAL CONTROL DRAWING FOR CONTROL LINE DETAILS



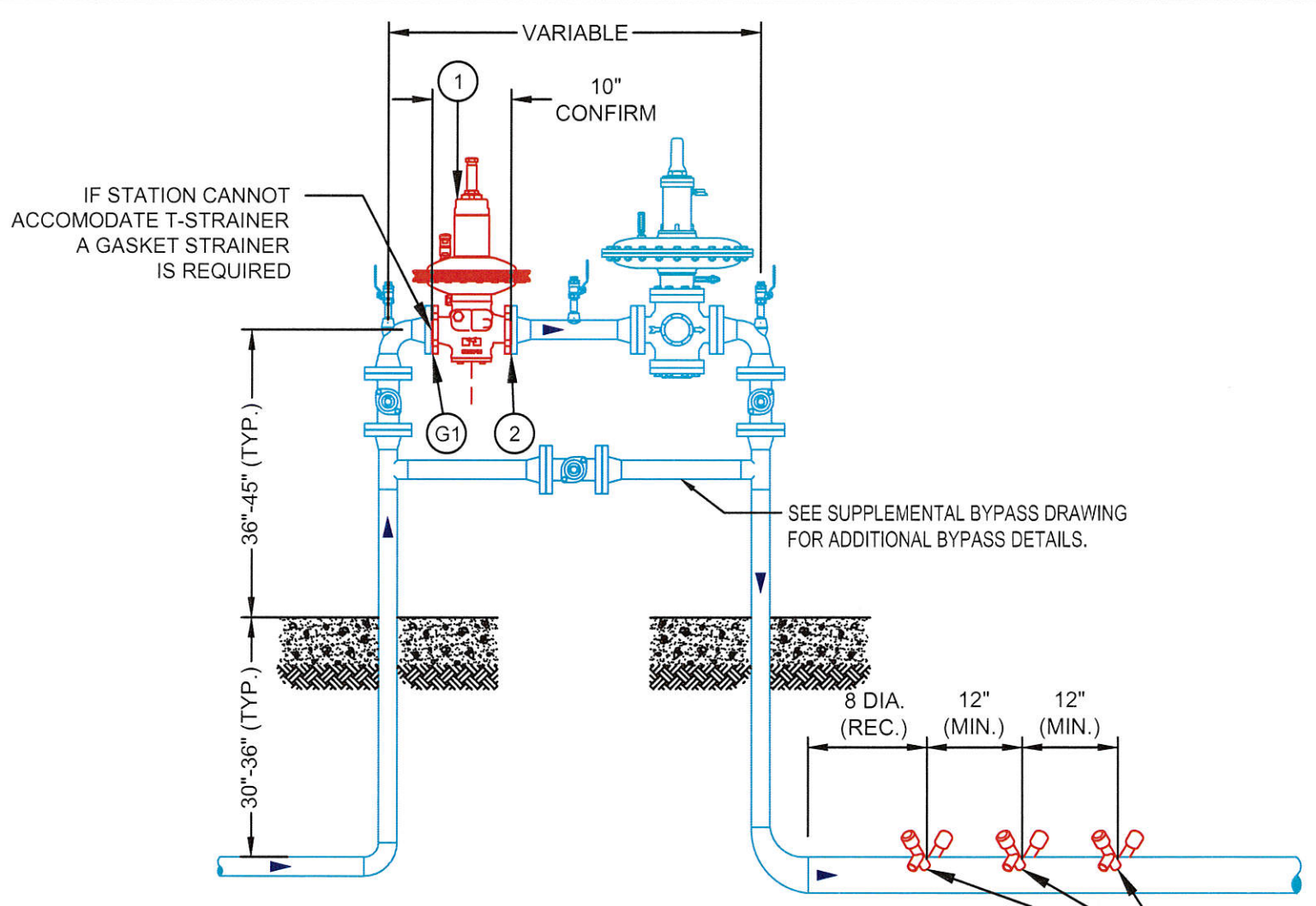
NO.	DATE	DRAWN	APPROVED	REVISION DESCRIPTION
C	2/13/19	TLATTA	GSMILLER	MODIFIED DESIGN BLOCK
1	10/11/18	TLATTA		4" x 4" GOOSENECK WITH 2" REGS - TYPICAL ELEVATION VIEW
2	10/19/18	G.S MILLER		

AS NOTED  
 NISOURCE LP STATION INITIATIVE  
 LP STATION DRAWING

PROJECT # GN-040204-150 1 OF 1

JOB NO. \_\_\_\_\_ BILL OF MATERIAL DWG. 1 OF 1

STOCK NO.	ITEM	QTY.	SIZE	DESCRIPTION
SPEC. ORDER	1	1	2"	REGULATOR, MONITOR, PIETRO FIORINTINI, NORVAL, 495Ø HEAD, DUCTILE IRON BODY, SEE TABLE 1 FOR MONITOR SPRING & SET POINTS, W/ ER MONITOR, W/ ON-BOARD SLAM SHUT, SLAM SHUT MODEL SN-91, RED/BLACK OPSO SPRING SET TO 20" w.c., (12" w.c. - 1.06 PSIG RANGE), WHITE UPSO SPRING SET TO 4" w.c., (4" w.c. - 9.2" w.c. RANGE), ANSI 150, 275# WP, MONITOR POSITION, FIELD ADJUST SET PT.
SPEC. ORDER	G1	1	2"	GASKET, STRAINER, MFG VSP, TORQ-KIT, ANSI-150, 316SS MESH SCREEN, WITH STUDS AND NUTS
28-46-406		4	5/8" x 3-3/4"	STUD BOLT, A193 B7, XYLAN COATED WITH 2 XYLAN COATED NUTS
40-73-0321		4	5/8" x 3"	STUD BOLT, ASTM-A193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
		1	2"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE



**\*\*NOTE\*\* TOTAL STATION SHUT DOWN IS RECOMMENDED BEFORE COMMENCING WORK**

**DESIGN NOTE**

1. %SMYS BASED OFF NEWLY INSTALLED EQUIPMENT
2. EXISTING EQUIPMENT %SYMS TO BE CALCULATED BY OTHERS
3. MAOP LIMITING ELEMENT BASED OFF OF NEWLY INSTALLED EQUIPMENT

DESIGN DATA		
DESIGN FACTOR	0.4	REF. CFR 192.111
DESIGN PRESSURE	275 PSIG	>= INLET MAOP
% SMYS AT DESIGN PRESSURE	6.06%	% SMYS BASED ON: 2", 0.154" w, GR. B
MIN. TEST PRESSURE	413 PSIG	(1.5 X DESIGN PRESSURE)
MAX. TEST PRESSURE	450 PSIG	(PER ANSI B16.5)
MIN. TEST DURATION	FIELD DET.	(PER GS 1500.010)
% SMYS AT MIN. PRESSURE TEST	9.10%	% SMYS BASED ON: 2", 0.154" w, GR. B
% SMYS AT MAX. PRESSURE TEST	9.91%	% SMYS BASED ON: 2", 0.154" w, GR. B
% SMYS AT MAOP	6.06%	% SMYS BASED ON: 2", 0.154" w, GR. B
MAOP LIMITING ELEMENT	PRESSURE TEST OR LOWEST FITTING MWFP	
TEST MEDIUM	NITROGEN/AIR	
% X-RAY	PER GAS STANDARDS	

TABLE 1

REGULATOR SIZE	AVAILABLE SPRING RANGE	RECOMMENDED SET POINTS
2" NORVAL 495Ø HEAD	10.04" - 14.06"wc BLACK SPRING 12.45" - 16.87"wc BLUE SPRING 15.27" - 24.11"wc WHITE SPRING	10" - 13"wc SET POINT 14" - 16" wc SET POINT 17" - 18" wc SET POINT
3" NORVAL 630Ø HEAD	8.43" - 14.46"wc WHITE SPRING 11.25" - 19.28"wc YELLOW SPRING	10" - 13"wc SET POINT 14" - 18" wc SET POINT
4" NORVAL 630Ø HEAD	8.84" - 14.86"wc WHITE SPRING 12.05" - 20.09"wc YELLOW SPRING	10" - 13"wc SET POINT 14" - 18" wc SET POINT

DIAMETERS TO BE CALCULATED OFF TAPPING PIPE SIZE  
 MINIMUM 5 CONTROL LINE PORTS REQUIRED FOR NORVAL MONITOR/SENSUS CONTROL  
 CONTROL LINE PORTS TO BE INSTALLED IN 10 O'CLOCK AND 2 O'CLOCK POSITION  
 SEE SUPPLEMENTAL CONTROL DRAWING FOR CONTROL LINE DETAILS

**2" MONITOR SWAP -- TYPICAL**  
 1"=20"

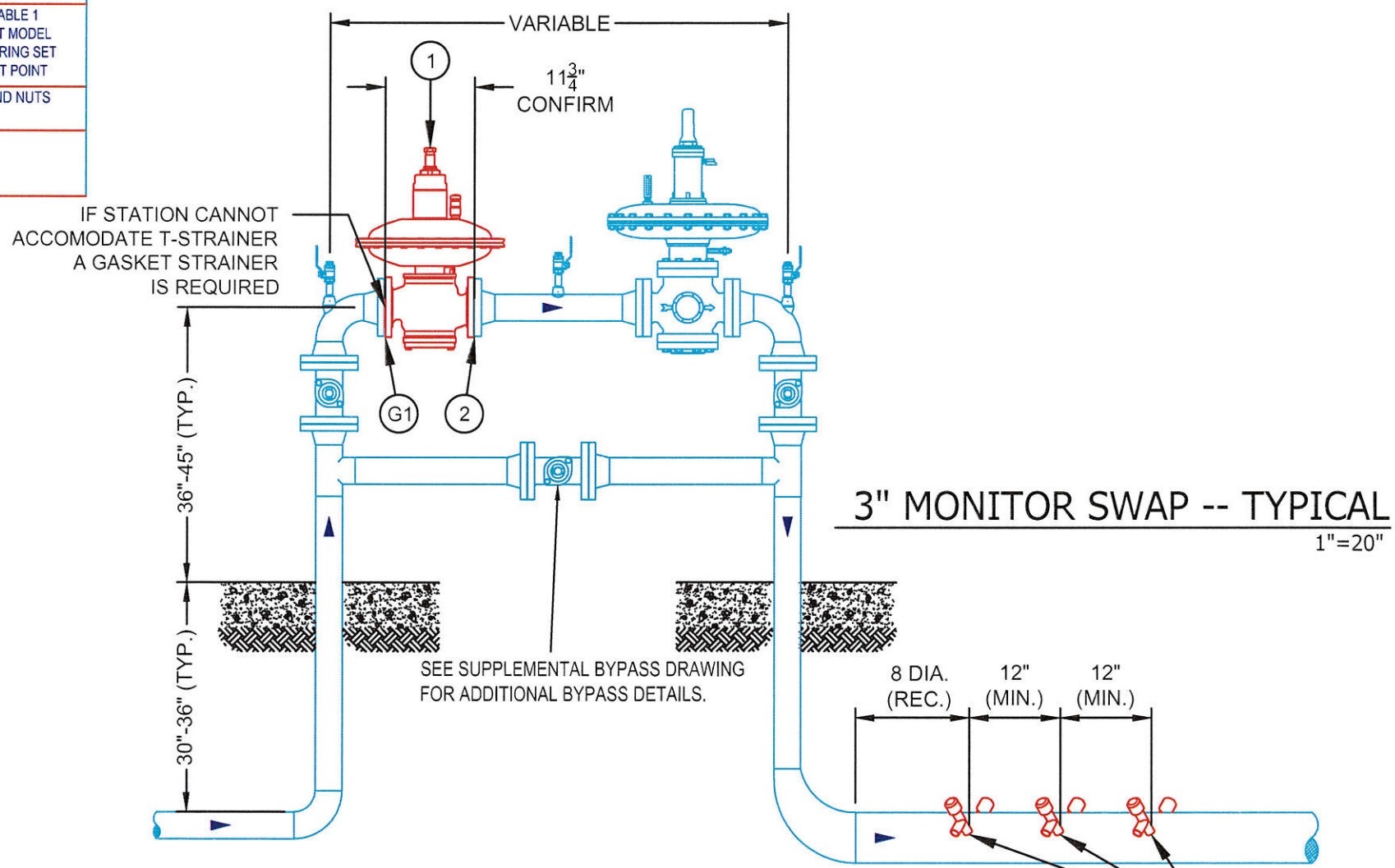
	DRAWN: MARK HALL DATE: 10/11/18 DRWG CHECKED: G.S MILLER DATE: 10/19/18	DRAWING TITLE: 2" MONITOR SWAP OUT - TYPICAL ELEVATION VIEW
	SCALE: AS NOTED	PROJECT TITLE: NISOURCE LP STATION INITIATIVE LP STATION DRAWING
	CITY/COUNTY: ##### STATE: #####	PROJECT ID: MR-02-150 PAGE NO: 1 OF 1
	NO. DATE DRAWN APPROVED REVISION DESCRIPTION	C 2/13/19 TLATA GSMILLER MODIFIED DESIGN BLOCK

JOB NO. \_\_\_\_\_

BILL OF MATERIAL

DWG. 1 OF 1

STOCK NO.	ITEM	QTY.	SIZE	DESCRIPTION
SPEC. ORDER	1	1	3"	REGULATOR, MONITOR, PIETRO FIORINTINI, NORVAL, 630Ø HEAD, DUCTILE IRON BODY, SEE TABLE 1 FOR MONITOR SPRING & SET POINTS, W/ ER MONITOR, W/ ON-BOARD SLAM SHUT, SLAM SHUT MODEL SN-91, RED/BLACK OPSO SPRING SET TO 20" w.c. (12" w.c. - 1.06 PSIG RANGE), WHITE UPSO SPRING SET TO 4" w.c. (4" w.c. - 9.2" w.c. RANGE), ANSI 150, 275# WP, MONITOR POSITION, FIELD ADJUST SET POINT
SPEC. ORDER	G1	1	3"	GASKET, STRAINER, MFG VSP, TORQ-KIT, ANSI-150, 316SS MESH SCREEN, WITH STUDS AND NUTS
28-46-408		4	5/8" x 4"	STUD BOLT, A193 B7, XYLAN COATED WITH 2 XYLAN COATED NUTS
40-73-0441		4	5/8" x 3-1/2"	STUD BOLT, ASTM-A193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
		1	3"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE



**\*\*NOTE\*\* TOTAL STATION SHUT DOWN IS RECOMMENDED BEFORE COMMENCING WORK**

DESIGN NOTE

1. %SMYS BASED OFF NEWLY INSTALLED EQUIPMENT
2. EXISTING EQUIPMENT %SYMS TO BE CALCULATED BY OTHERS
3. MAOP LIMITING ELEMENT BASED OFF OF NEWLY INSTALLED EQUIPMENT

DESIGN DATA		
DESIGN FACTOR	0.4	REF. CFR 192.111
DESIGN PRESSURE	275 PSIG	>= INLET MAOP
% SMYS AT DESIGN PRESSURE	6.37%	% SMYS BASED ON: 3", 0.216" w, GR. B
MIN. TEST PRESSURE	413 PSIG	(1.5 X DESIGN PRESSURE)
MAX. TEST PRESSURE	450 PSIG	(PER ANSI B16.5)
MIN. TEST DURATION	FIELD DET.	(PER GS 1500.010)
% SMYS AT MIN. PRESSURE TEST	9.56%	% SMYS BASED ON: 3", 0.216" w, GR. B
% SMYS AT MAX. PRESSURE TEST	10.42%	% SMYS BASED ON: 3", 0.216" w, GR. B
% SMYS AT MAOP	6.37%	% SMYS BASED ON: 3", 0.216" w, GR. B
MAOP LIMITING ELEMENT	PRESSURE TEST OR LOWEST FITTING MWFP	
TEST MEDIUM	NITROGEN/AIR	
% X-RAY	PER GAS STANDARDS	

TABLE 1

REGULATOR SIZE	AVAILABLE SPRING RANGE	RECOMMENDED SET POINTS
2" NORVAL 495Ø HEAD	10.04" - 14.06"wc BLACK SPRING 12.45" - 16.87"wc BLUE SPRING 15.27" - 24.11"wc WHITE SPRING	10" - 13"wc SET POINT 14" - 16" wc SET POINT 17" - 18" wc SET POINT
3" NORVAL 630Ø HEAD	8.43" - 14.46"wc WHITE SPRING 11.25" - 19.28"wc YELLOW SPRING	10" - 13"wc SET POINT 14" - 18" wc SET POINT
4" NORVAL 630Ø HEAD	8.84" - 14.86"wc WHITE SPRING 12.05" - 20.09"wc YELLOW SPRING	10" - 13"wc SET POINT 14" - 18"wc SET POINT

DIAMETERS TO BE CALCULATED OFF TAPPING PIPE SIZE  
 MINIMUM 5 CONTROL LINE PORTS REQUIRED FOR NORVAL MONITOR/SENSUS CONTROL  
 CONTROL LINE PORTS TO BE INSTALLED IN 10 O'CLOCK AND 2 O'CLOCK POSITION  
 SEE SUPPLEMENTAL CONTROL DRAWING FOR CONTROL LINE DETAILS

**NISource Energy Distribution**

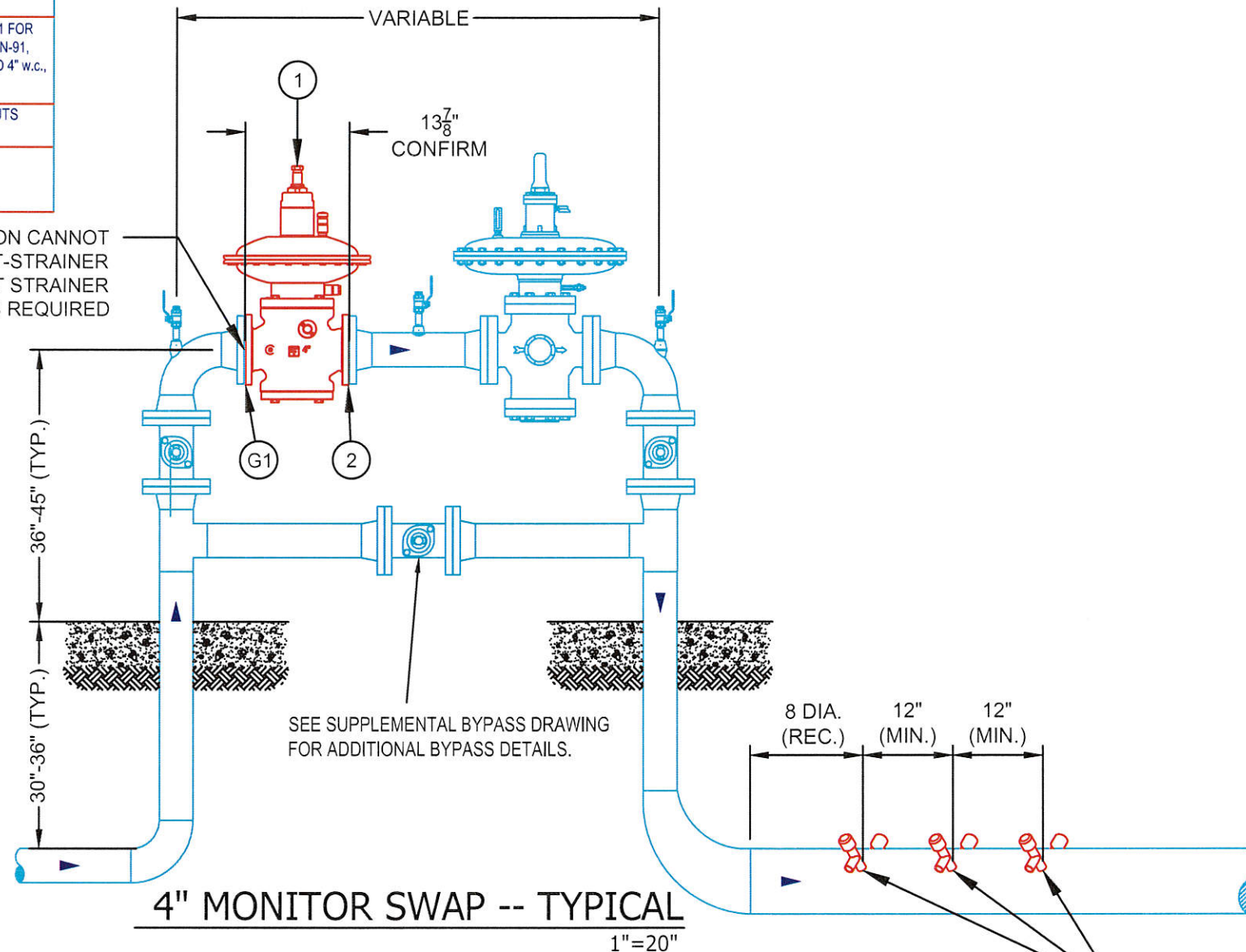
DRAWN	MARK HALL	DATE	10/11/18	DRAWING TITLE	3" MONITOR SAWP OUT - TYPICAL
DWG CHECKED	G.S MILLER	DATE	10/19/18	ELEVATION VIEW	
SCALE	AS NOTED		PROJECT TITLE	NISOURCE LP STATION INITIATIVE LP STATION DRAWING	
CITY/COUNTY	STATE	SIZE	L	PROJECT ID	MR-03-150
NO.	DATE	DRAWN	APPROVED	REVISION DESCRIPTION	PAGE NO. 1 OF 1

JOB NO. \_\_\_\_\_

BILL OF MATERIAL

DWG. 1 OF 1

STOCK NO.	ITEM	QTY.	SIZE	DESCRIPTION
SPEC ORDER	1	1	4"	REGULATOR, MONITOR, PIETRO FIORINTINI, NORVAL, 6300 HEAD, DUCTILE IRON BODY, SEE TABLE 1 FOR MONITOR SPRING & SET POINTS. W/ ER MONITOR, W/ ON-BOARD SLAM SHUT, SLAM SHUT MODEL SN-91, RED/BLACK OPSO SPRING SET TO 20" w.c., (12" w.c. - 1.06 PSIG RANGE), WHITE UPSO SPRING SET TO 4" w.c., (4" w.c. - 9.2" w.c. RANGE), ANSI 150, 116# WP, MONITOR POSITION, FIELD ADJUST SET POINT
SPEC. ORDER	G1	1	4"	GASKET, STRAINER, MFG VSP, TORQ-KIT, ANSI-150, 316SS MESH SCREEN, WITH STUDS AND NUTS
		8	5/8" x 4"	STUD BOLT, A193 B7, XYLAN COATED WITH 2 XYLAN COATED NUTS
28-46-408	2	8	5/8" x 3-1/2"	STUD BOLT, ASTM-A193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0561		1	4"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE



**\*\*NOTE\*\* TOTAL STATION SHUT DOWN IS RECOMMENDED BEFORE COMMENCING WORK**

DESIGN NOTE

1. %SMYS BASED OFF NEWLY INSTALLED EQUIPMENT
2. EXISTING EQUIPMENT %SYMS TO BE CALCULATED BY OTHERS
3. MAOP LIMITING ELEMENT BASED OFF OF NEWLY INSTALLED EQUIPMENT

DESIGN DATA		
DESIGN FACTOR	0.4	REF. CFR 192.111
DESIGN PRESSURE	116 PSIG	>= INLET MAOP
% SMYS AT DESIGN PRESSURE	3.15 %	% SMYS BASED ON: 4", 0.237" w, GR. B.
MIN. TEST PRESSURE	413 PSIG	(1.5 X DESIGN PRESSURE)
MAX. TEST PRESSURE	450 PSIG	(PER ANSI B16.5)
MIN. TEST DURATION	FIELD DET.	(PER GS 1500.010)
% SMYS AT MIN. PRESSURE TEST	11.20%	% SMYS BASED ON: 4", 0.237" w, GR. B.
% SMYS AT MAX. PRESSURE TEST	12.21%	% SMYS BASED ON: 4", 0.237" w, GR. B.
% SMYS AT MAOP	3.15 %	% SMYS BASED ON: 4", 0.237" w, GR. B.
MAOP LIMITING ELEMENT	PRESSURE TEST OR LOWEST FITTING MWP	
TEST MEDIUM	NITROGEN/AIR	
% X-RAY	PER GAS STANDARDS	

TABLE 1

REGULATOR SIZE	AVAILABLE SPRING RANGE	RECOMMENDED SET POINTS
2" NORVAL 4950 HEAD	10.04" - 14.06"wc BLACK SPRING 12.45" - 16.87"wc BLUE SPRING 15.27" - 24.11"wc WHITE SPRING	10" - 13"wc SET POINT 14" - 16" wc SET POINT 17" - 18" wc SET POINT
3" NORVAL 6300 HEAD	8.43" - 14.46"wc WHITE SPRING 11.25" - 19.28"wc YELLOW SPRING	10" - 13"wc SET POINT 14" - 18" wc SET POINT
4" NORVAL 6300 HEAD	8.84" - 14.86"wc WHITE SPRING 12.05" - 20.09"wc YELLOW SPRING	10" - 13"wc SET POINT 14" - 18"wc SET POINT

DIAMETERS TO BE CALCULATED OFF TAPPING PIPE SIZE  
 MINIMUM 5 CONTROL LINE PORTS REQUIRED FOR NORVAL MONITOR/SENSUS CONTROL  
 CONTROL LINE PORTS TO BE INSTALLED IN 10 O'CLOCK AND 2 O'CLOCK POSITION  
 SEE SUPPLEMENTAL CONTROL DRAWING FOR CONTROL LINE DETAILS

	DATE	10/11/18	DRAWING TITLE	4" MONITOR SWAP OUT - TYPICAL
	SCALE	AS NOTED	PROJECT TITLE	NISOURCE LP STATION INITIATIVE LP STATION DRAWING
	CITY/COUNTY	STATE	PROJECT ID	MR-04-150
	DATE	10/19/18	SIZE	L
NO.	2/13/19	DATE	2	1
NO.	2/13/19	DATE	2	1
NO.	2/13/19	DATE	2	1
NO.	2/13/19	DATE	2	1

JOB NO. \_\_\_\_\_

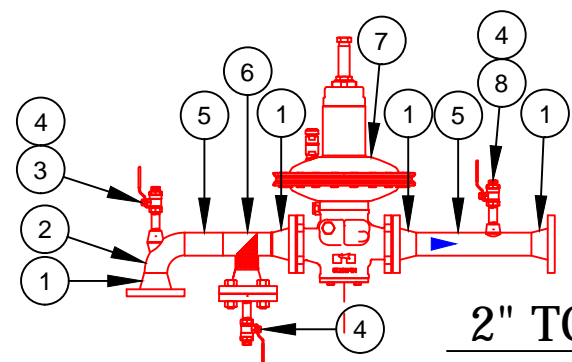
BILL OF MATERIAL

DWG. 1 OF 1

STOCK NO.	ITEM	QTY.	SIZE	DESCRIPTION
19-65-021	1	4	2"	FLG WELD NECK, FF, ANSI 150, F.S., BORED TO 0.154" WALL; 4 BOLTS PER FLANGE
28-46-406		20	5/8" x 3"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0321		5	2"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
17-15-095	2	1	2"	ELL, WELDING, 90 DEG., L.R., GRADE B, 0.154" WALL
17-86-013	3	1	1/2"	ELBOLET, FOR 3/4" THROUGH 36" PIPE, 3000 #, C.S.
24-04-230	4	3	1/2" x 3"	XH NIPPLE, GB, SMLS, CS A106, TBE
16-05-131		3	1/2"	VALVE, BALL, R.P., THREADED, SS, S8000-M3, 2000# W.O.G.
26-58-420		3	1/2"	PLUG, HEX HEAD, XH CS, 6000#, SA105
07-52-0200	5	2' (MIN.)	2"	PIPE, P.E., 0.154" STD WALL, X-52, BARE, C.S., ERW, API5L
48-99-050	6	1	2"	STRAINER, APOLLO, 02-TSW-275, 150#, CS GB, WLD X WLD, STR0022 W/100 MESH LINER
SPEC. ORDER	7	1	2"	REGULATOR, MONITOR, PIETRO FIORINTINI, NORVAL, 4950 HEAD, DUCTILE IRON BODY, SEE TABLE 1 FOR MONITOR SPRING & SET POINTS, W/ ER MONITOR, W/ ON-BOARD SLAM SHUT, SLAM SHUT MODEL SN-91, RED/BLACK OPSO SPRING SET TO 20" w.c., (12" w.c. - 1.06 PSIG RANGE), WHITE UPSO SPRING SET TO 4" w.c., (4" w.c. - 9.2" w.c. RANGE), ANSI 150, 275# WP, MONITOR POSITION, FIELD ADJUST SET PT.
17-88-028	8	1	1/2"	THREAOLET, FOR 2" THROUGH 2-1/2" PIPE, 3000 #, C.S.
19-14-011	T1	2	2"	FLANGE, BLIND, ANSI 150, F.F., CS, SA105; 4 BOLTS PER FLANGE
28-46-406		12	5/8" x 3"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0321		4	2"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
SPEC. ORDER	G1	AS NEEDED	2" 5/8" x 3-3/4"	GASKET, STRAINER, MFG VSP, TORQ-KIT, ANSI-150, 316SS MESH SCREEN, WITH STUDS AND NUTS STUD BOLT, A193 B7, XYLAN COATED WITH 2 XYLAN COATED NUTS

TABLE 1

REGULATOR SIZE	AVAILABLE SPRING RANGE	RECOMMENDED SET POINTS
2" NORVAL 4950 HEAD	10.04" - 14.06"wc	BLACK SPRING
	12.45" - 16.87"wc	BLUE SPRING
	15.27" - 24.11"wc	WHITE SPRING
3" NORVAL 6300 HEAD	8.43" - 14.46"wc	WHITE SPRING
	11.25" - 19.28"wc	YELLOW SPRING
4" NORVAL 6300 HEAD	8.84" - 14.86"wc	WHITE SPRING
	12.05" - 20.09"wc	YELLOW SPRING



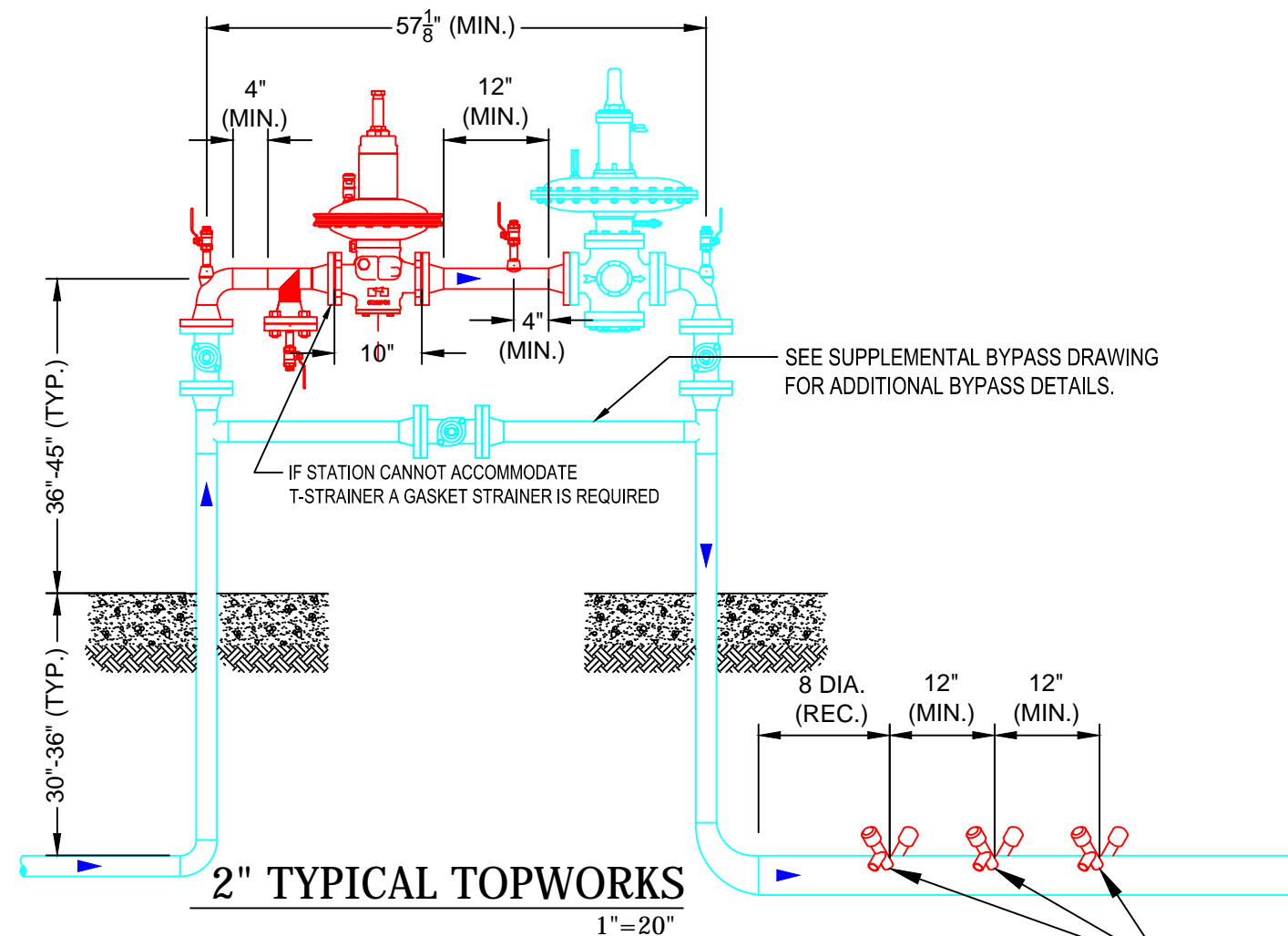
2" TOPWORKS DESIGN -- TYPICAL

1" = 20"

DESIGN NOTE

1. %SMYS BASED OFF NEWLY INSTALLED EQUIPMENT
2. EXISTING EQUIPMENT %SYMS TO BE CALCULATED BY OTHERS
3. MAOP LIMITING ELEMENT BASED OFF OF NEWLY INSTALLED EQUIPMENT

DESIGN DATA (EXCLUDING REGS)		
DESIGN FACTOR	0.4	REF. CFR 192.111
DESIGN PRESSURE	275 PSIG	>= INLET MAOP
% SMYS AT DESIGN PRESSURE	6.06%	% SMYS BASED ON: 2", 0.154" w. GR. B
MIN. TEST PRESSURE	413 PSIG	(1.5 X DESIGN PRESSURE)
MAX. TEST PRESSURE	450 PSIG	(PER ANSI B16.5)
MIN. TEST DURATION	FIELD DET.	(PER GS 1500,010)
% SMYS AT MIN. PRESSURE TEST	9.10%	% SMYS BASED ON: 2", 0.154" w. GR. B
% SMYS AT MAX. PRESSURE TEST	9.91%	% SMYS BASED ON: 2", 0.154" w. GR. B
% SMYS AT MAOP	6.06%	% SMYS BASED ON: 2", 0.154" w. GR. B
MAOP LIMITING ELEMENT	PRESSURE TEST OR LOWEST FITTING MWP	
TEST MEDIUM	NITROGEN/AIR	
% X-RAY	PER GAS STANDARDS	



2" TYPICAL TOPWORKS

1" = 20"

DIAMETERS TO BE CALCULATED OFF TAPPING PIPE SIZE

MINIMUM 5 CONTROL LINE PORTS REQUIRED FOR NORVAL MONITOR/SENSUS CONTROL  
 CONTROL LINE PORTS TO BE INSTALLED IN 10 O'CLOCK AND 2 O'CLOCK POSITION  
 SEE SUPPLEMENTAL CONTROL DRAWING FOR CONTROL LINE DETAILS

**\*\*NOTE\*\* TOTAL STATION SHUT DOWN IS RECOMMENDED BEFORE COMMENCING WORK**

	DRAWN	MARK HALL	DATE	10/11/18	DRAWING TITLE	2" TOPWORKS REPLACEMENT - TYPICAL
	ENG. CHECKED	G.S MILLER	DATE	10/19/18	ELEVATION VIEW	
	SCALE	AS NOTED		PROJECT TITLE	NISOURCE LP STATION INITIATIVE	
	CITY/COUNTY	#####		STATE	LP STATION DRAWING	
			PROJECT ID	PT-02-150	PAGE NO.	1 OF 1

C	NO.	DATE	DRAWN	APPROVED	MODIFIED DESIGN BLOCK	REVISION DESCRIPTION
C		2/13/19	TLAITA	GSMILLER	MODIFIED DESIGN BLOCK	

JOB NO. \_\_\_\_\_

BILL OF MATERIAL

DWG. 1 OF 1

STOCK NO.	ITEM	QTY.	SIZE	DESCRIPTION
19-65-032	1	4	3"	FLG WELD NECK, FF, ANSI 150, F.S., BORED TO 0.216" WALL; 4 BOLTS PER FLANGE
28-46-408	20		5/8" x 3-1/2"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0441	5		3"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
17-15-127	2	1	3"	ELL, WELDING, 90 DEG., L.R., GRADE B, 0.216" WALL
17-86-013	3	1	1/2"	ELBOLET, FOR 3/4" THROUGH 36" PIPE, 3000 #, C.S.
24-04-230	4	3	1/2" x 3"	XH NIPPLE, GB, SMLS, CS A106, TBE
16-05-131		3	1/2"	VALVE, BALL, R.P., THREADED, SS, S8000-M3, 2000# W.O.G.
26-58-420		3	1/2"	PLUG, HEX HEAD, XH CS, 6000#, SA105
07-52-0300	5	2' (MIN.)	3"	PIPE, P.E., 0.216" STD WALL, X-52, BARE, C.S., ERW, API5L
48-99-051	6	1	3"	STRAINER, APOLLO, 03-TSW-275, 150#, CS GB, WLD X WLD, STR0022 W/100 MESH LINER
SPEC. ORDER	7	1	3"	REGULATOR, MONITOR, PIETRO FIORINTINI, NORVAL, 6300 HEAD, DUCTILE IRON BODY, SEE TABLE 1 FOR MONITOR SPRING & SET POINTS, W/ ER MONITOR, W/ ON-BOARD SLAM SHUT, SLAM SHUT MODEL SN-91, RED/BLACK OPSO SPRING SET TO 20" w.c., (12" w.c. - 1.06 PSIG RANGE), WHITE UPSO SPRING SET TO 4" w.c., (4" w.c. - 9.2" w.c. RANGE), ANSI 150, 275# WP, MONITOR POSITION, FIELD ADJUST SET POINT
17-88-030	8	1	1/2"	THREDOLET, FOR 3" THROUGH 8" PIPE, 3000 #, C.S.
19-14-015	T1	2	3"	FLANGE, BLIND, ANSI 150, F.F., CS, SA105; 4 BOLTS PER FLANGE
28-46-408		12	5/8" x 3-1/2"	STUD BOLT, ASTM A-193-B7, THREADED ENTIRE LENGTH, W/ 2 HEX NUTS A194-2H
40-73-0441		4	3"	GASKET FLAT RING, ANSI 150, 1/16" THICK, NON-ASBESTOS, NON-GLASS FIBER
				GARLOCK BLUE-GARD STYLE 3000, 1000 PSIG MAXIMUM PRESSURE
SPEC. ORDER	G1	AS NEEDED	3"	GASKET, STRAINER, MFG VSP, TORQ-KIT, ANSI-150, 316SS MESH SCREEN, WITH STUDS AND NUTS
			5/8" x 4"	STUD BOLT, A193 B7, Xylan COATED WITH 2 Xylan COATED NUTS

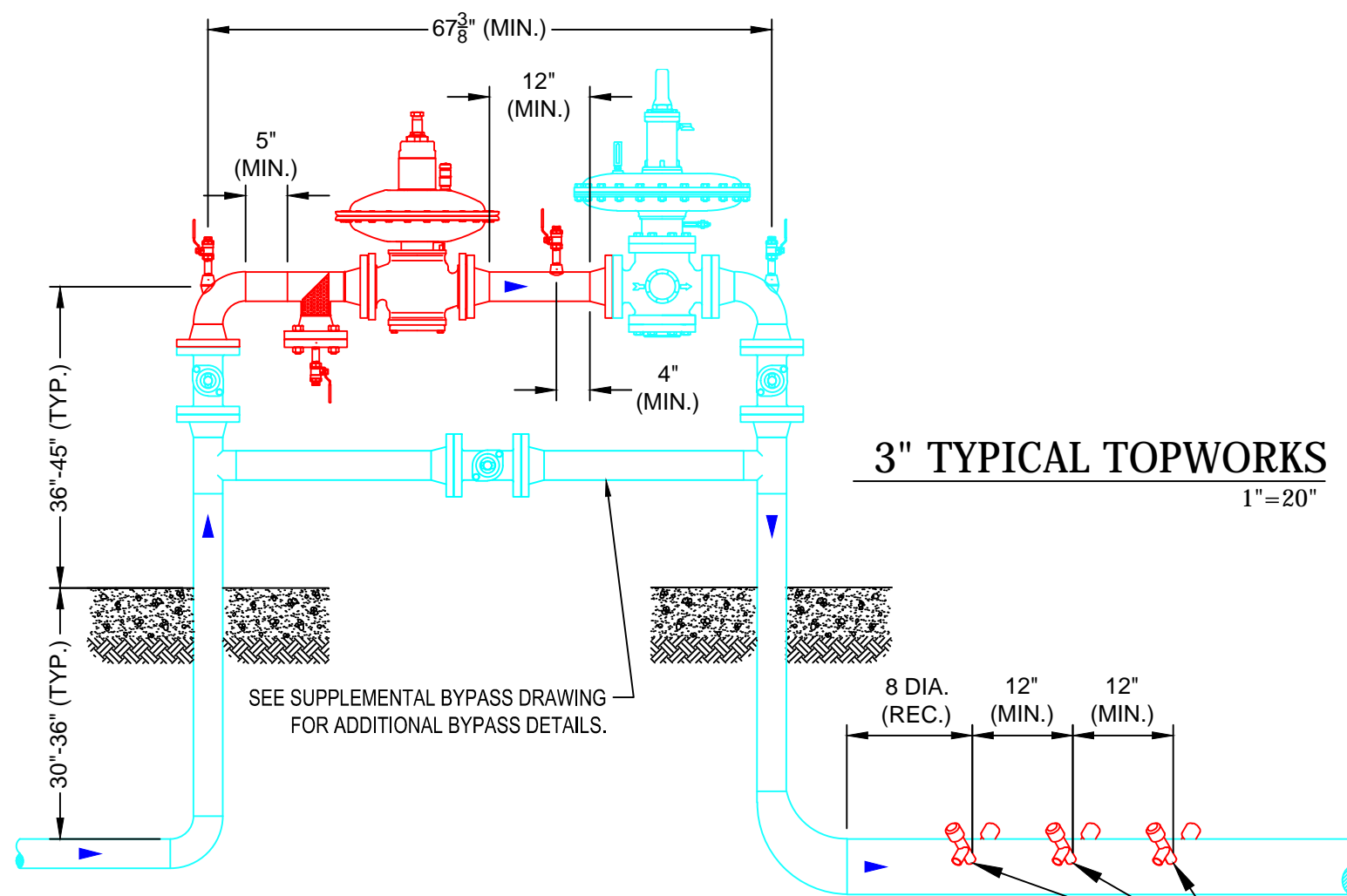
TABLE 1

REGULATOR SIZE	AVAILABLE SPRING RANGE	RECOMMENDED SET POINTS
2" NORVAL 4950 HEAD	10.04" - 14.06"wc	BLACK SPRING
	12.45" - 16.87"wc	BLUE SPRING
	15.27" - 24.11"wc	WHITE SPRING
3" NORVAL 6300 HEAD	8.43" - 14.46"wc	WHITE SPRING
	11.25" - 19.28"wc	YELLOW SPRING
4" NORVAL 6300 HEAD	8.84" - 14.86"wc	WHITE SPRING
	12.05" - 20.09"wc	YELLOW SPRING

DESIGN NOTE

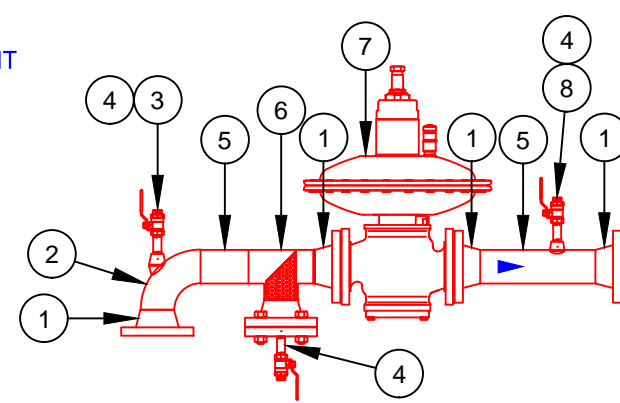
1. %SMYS BASED OFF NEWLY INSTALLED EQUIPMENT
2. EXISTING EQUIPMENT %SYMS TO BE CALCULATED BY OTHERS
3. MAOP LIMITING ELEMENT BASED OFF OF NEWLY INSTALLED EQUIPMENT

DESIGN DATA (EXCLUDING REGS)	
DESIGN FACTOR	0.4 REF. CFR 192.111
DESIGN PRESSURE	275 PSIG >= INLET MAOP
% SMYS AT DESIGN PRESSURE	6.37% % SMYS BASED ON: 3", 0.216" w, GR. B
MIN. TEST PRESSURE	413 PSIG (1.5 X DESIGN PRESSURE)
MAX. TEST PRESSURE	450 PSIG (PER ANSI B16.5)
MIN. TEST DURATION	FIELD DET. (PER GS 1500,010)
% SMYS AT MIN. PRESSURE TEST	9.56% % SMYS BASED ON: 3", 0.216" w, GR. B
% SMYS AT MAX. PRESSURE TEST	10.42% % SMYS BASED ON: 3", 0.216" w, GR. B
% SMYS AT MAOP	6.37% % SMYS BASED ON: 3", 0.216" w, GR. B
MAOP LIMITING ELEMENT	PRESSURE TEST OR LOWEST FITTING MWP
TEST MEDIUM	NITROGEN/AIR
% X-RAY	PER GAS STANDARDS



DIAMETERS TO BE CALCULATED OFF TAPPING PIPE SIZE  
 MINIMUM 5 CONTROL LINE PORTS REQUIRED FOR NORVAL MONITOR/SENSUS CONTROL  
 CONTROL LINE PORTS TO BE INSTALLED IN 10 O'CLOCK AND 2 O'CLOCK POSITION  
 SEE SUPPLEMENTAL CONTROL DRAWING FOR CONTROL LINE DETAILS

**\*\*NOTE\*\* TOTAL STATION SHUT DOWN IS RECOMMENDED BEFORE COMMENCING WORK**



3" TYPICAL DESIGN

1" = 20"

NO.	DATE	DRAWN	APPROVED	REVISION DESCRIPTION
C	2/13/19	TLATA	GSMILLER	MODIFIED DESIGN BLOCK

	DRAWN: MARK HALL DATE: 10/11/18 DRG CHECKED: G.S MILLER DATE: 10/19/18	DRAWING TITLE: 3" TOPWORKS REPLACEMENT - TYPICAL ELEVATION VIEW
	SCALE: AS NOTED CITY/COUNTY: ##### STATE: #####	PROJECT TITLE: NISOURCE LP STATION INITIATIVE LP STATION DRAWING
PROJECT ID: PT-03-150 PAGE NO: 1 OF 1	ISSUE: C	