

# Oil & Natural Gas COVID-19 Responsible Recovery Compendium



**OIL AND  
NATURAL GAS  
SUBSECTOR  
COORDINATING  
COUNCIL**

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# Oil & Natural Gas COVID-19 Responsible Recovery Compendium

## INTRODUCTION

Oil and natural gas are key resources for the Nation – providing the energy needed to heat homes in the winter and cool them in the summer, generate electricity, and fuel private and commercial activities such as domestic truck fleets, air travel, and emergency response vehicles. These two industries comprise the Oil and Natural Gas (ONG) Subsector, a critical infrastructure of the broader Energy Sector. The U.S. Department of Homeland Security (DHS), Cybersecurity and Infrastructure Security Agency (CISA) – responsible for providing strategic guidance as assigned under the Homeland Security Act of 2002 – published [guidance](#) identifying oil and natural gas operators as “Essential Critical Infrastructure Workers” for the energy industry.

The diversity and complexity of these two value chains are often difficult to explain and understand. Starting at the well-head, the molecules of energy traverse major operational segments before being consumed by end users. Figures 1 and 2 are schematic representations of each value chain. These major operational segments and the placement in their respective value chains provide the context to understanding the impact, both upstream and downstream, of COVID-19. Though the adversity and the challenges vary across the segments, the single, over-arching commonality is these industries are operating in a ‘new normal’ and will be for months.

The “ONG COVID-19 Responsible Recovery Compendium” is intended to provide stakeholders from federal, state, local, tribal, and private sector an overview of the challenges facing the different segments of the oil value chain, natural gas value chain, and the by-product value chain as the demand for fuel increases for travel, manufacturing, commercial business, power generation, etc., and innovative actions being employed for responsible recovery.

## Shared Responsibility on the Road to Recovery

### Government Leadership

The government’s role in the ONG COVID-19 responsible recovery is tantamount to the role of the industry operator. Timely and credible data provided by federal, state, and local governments are critical to an operator’s decisions to ramp-up essential work and phase in non-essential work. Inconsistent information from the government could result in misinformed business decisions that impact the welfare of employees, contractors, and the general public.

Federal and state governments also play a central role in encouraging manufacturers to produce the necessary volumes of vital health testing and protective supplies including, COVID-19 testing, facial coverings (flame resistant rated and non-flame resistant rated), disinfectant, and thermometers for daily health screenings. These items are particularly important as a major segment of the ONG subsector works in critical control rooms, field operations, maintenance and construction, and areas which have limited options for social distancing or other preventive measures. Recognizing allocation of such supplies has historically been at the state-level, there remains a need for federal coordination in this unprecedented event since the majority of ONG infrastructure is not confined by state borders.

### Enforcement Discretion

Many ONG segments are operating under temporary agency enforcement discretion policies toward conducting non-essential compliance activities that were made difficult during the height of the pandemic. Government should consider appropriate timelines in the phasing-out of these policies so not to cause an unmanageable surge in demand for the equipment and expertise to perform these compliance activities. For example, agencies have provided relief from certain personnel re-training and re-qualification regulations, and it will take many months after social distancing restrictions are relaxed to fully resolve the training and qualification backlog. Further, agencies may consider temporarily allowing alternate inspection methods, e.g., in-service tank inspections as opposed to out-of-service tank inspections to limit system downtime.

Figure 1: Major Operational Segments of Oil Value Chain

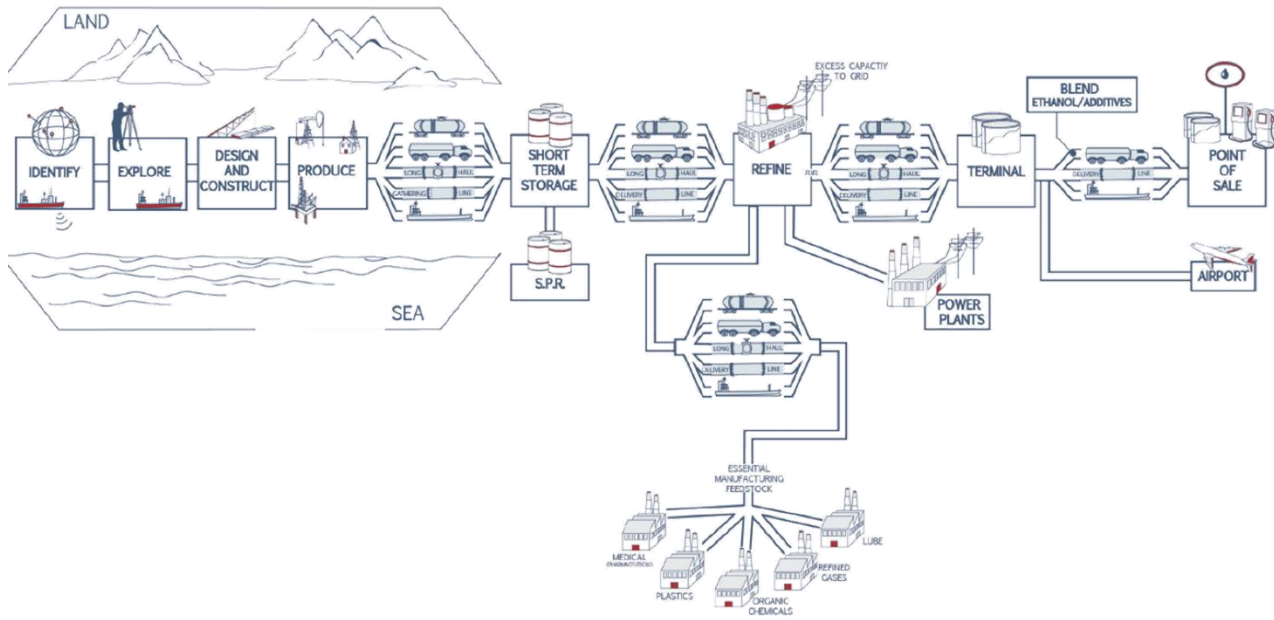
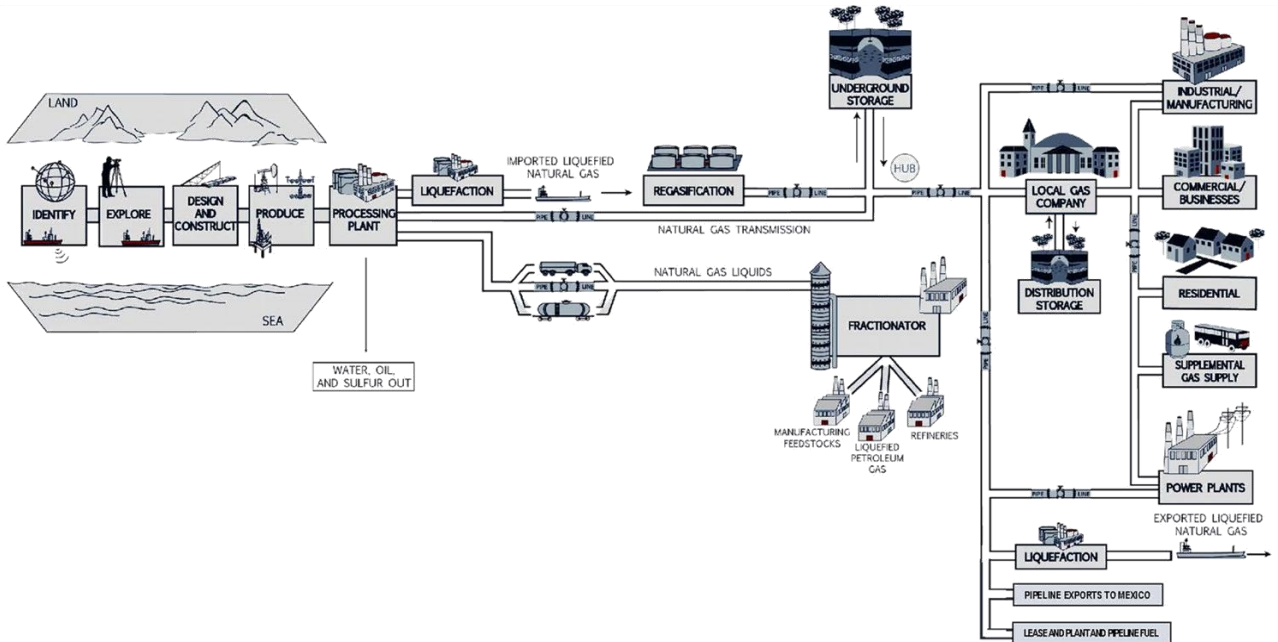


Figure 2: Major Operational Segments of Natural Gas Value Chain



Both schematics courtesy of API "Oil & Natural Gas Industry Preparedness Handbook"

For the most part, the business enterprise workforce for these value chains have teleworked or employed other mechanisms to continue office work remotely. However, employees, including but not limited to, field personnel, facility operators (e.g., control room, terminal, natural gas storage, compressor station, refineries, propane storage tank farm, and liquefied

natural gas), and retailers, technicians, and deliverers, are among the thousands who continued to work in their pre-COVID-19 roles, while practicing COVID-19 health countermeasures. Appendix A contains tables that detail the operational realities and challenges faced by major operations segment of each value chain.

Propane is one of many important by-products of the oil and natural gas value chains, providing fuel for residential and commercial end users and serving agricultural communities across the U.S. Because major operational segments associated with propane deviate from the oil and natural gas value chains starting midstream, Appendix B contains a graphic illustrating the propane path and a table detailing propane-specific operational realities and challenges.

This compendium is tailored to unique challenges of the overall ONG subsector. Common challenges faced by all infrastructure sectors, such as office re-entry, business travel, technology, etc., are not discussed.

## INNOVATIVE MEASURES

The ONG subsector has implemented innovative measures to protect its employees while continuing the safe and reliable delivery of energy sources for the country. Government should also continue to support innovative approaches to accomplishing compliance activities in accordance with social distancing restrictions—such as conducting training and qualification activities virtually.

Examples, include, but are not limited to:

- The use of N95 respirators or other non-medical masks in tasks not normally requiring them for routine work, such as entering homes to perform natural gas or propane distribution system safety work, and the appropriate use of masks in control rooms and in maintenance work where social distancing is not feasible
- Innovative use of “barriers” in the workplace
  - Placing barriers between workers in control rooms and other operating locations
  - Placing barriers between the customer and the retail clerks in convenience stores and retail offices
- Partnering with the U.S. Coast Guard/Customs and Border Patrol to ensure foreign marine vessels and their crews did not pose an exposure threat to the U.S. workers early in the outbreak and going forward

- Ensuring Disaster Recovery Plans are robust and capable of handling the telework volume with minimal interruptions
- Engagement with federal partners in ensuring cybersecurity protocols are updated
- Information sharing through the [Oil & Natural Gas Information Sharing & Analysis Center](#) (ISAC) and the [Downstream Natural Gas ISAC](#)
- Staggering work schedules to minimize contact among workers
- Using Computer-Based-Training technology
- Utilizing electronic communication in lieu of paper delivery confirmation notices and invoices to reduce potential person-to-person contact

## NATIONAL RESPONSE FRAMEWORK (NRF)

The ONG subsector continues to support the [NRF](#) through the Emergency Support Function #12 – Energy Annex ([ESF12](#)) activities at the federal and state level. “Industry at large” is familiar with the NRF, and the role industry plays in the framework. The NRF has been utilized during other natural and man-made emergencies. In addition, the ONG Subsector Coordinating Council plays a critical role in the public/private partnership with DHS, the Department of Energy, and the Cross-Sector Council through the Critical Infrastructure Partnership Advisory Council.

## POST-INITIAL PANDEMIC PHASE

Recognizing warnings of the Centers for Disease Control and Prevention regarding the ‘second wave’ of the COVID-19 epidemic, the ONG subsector is planning appropriately. Industry continues gathering and analyzing data on the spread of the virus to allow informed decision making. As such, the reliability of the data shared by the government is integral. Further, leveraging the ONG subsectors’ new knowledge of COVID-19 countermeasures, e.g., social distancing, teleworking, innovative staff scheduling, the use of appropriate PPE when necessary, and continual health screenings, may help minimize the impact from the next phases of COVID-19.

# Oil & Natural Gas COVID-19 Responsible Recovery Compendium

## Appendix A – Operational Realities and Challenges Associated with Oil & Natural Gas Value Chains

Table 1 is a matrix of the different segments of the oil value chain and associated challenges confronting each for responsible recovery.

Oil Value Chain Operational Segments	Operational Reality	Challenge	Mitigation Strategies <sup>1</sup>
<b>Drilling &amp; Production – Offshore</b>	<ul style="list-style-type: none"> <li>• Reduced activity, logistics challenges for personnel and supplies</li> <li>• Lost knowledge assets each time industry downturns</li> <li>• Direct &amp; indirect cost to recovery for each location affected by quarantine conditions</li> </ul>	<p><b>Logistics:</b></p> <ul style="list-style-type: none"> <li>• Transportation offshore via crew boats or helicopters from shorebases</li> <li>• Shift from 14/14 to 28/21-day (on/off) schedules</li> <li>• Crew impacts from scheduling changes and pre-hitch quarantines</li> <li>• Development of formal quarantine response plan from an operational/production perspective</li> </ul> <p><b>Social Distancing:</b></p> <ul style="list-style-type: none"> <li>• Social distancing on platforms, flotels, rigs and living quarters located on offshore facilities</li> <li>• Living/working in shared air-conditioning</li> <li>• No formally designated quarantine space with positive or negative pressure rooms with secondary ventilation</li> </ul> <p><b>PPE/Cleaning Supplies:</b></p> <ul style="list-style-type: none"> <li>• Access to PPE, disinfectant, and other items for safe work environment and response to suspected illness</li> <li>• Formal education &amp; training for all persons on the significance of plan and changes, how to safely reuse masks, and how to keep family safe while offshore</li> </ul> <p><b>Medical Capability/Capacity:</b></p> <ul style="list-style-type: none"> <li>• Facilities not designed to treat outbreaks</li> <li>• Many facilities do not have medical personnel on site; exposure risk of singular medical provider for those that have medical personnel on site</li> <li>• Underlying respiratory conditions (allergies, chronic smoker, etc.) can potentially mask COVID-19 symptoms</li> <li>• Limitations of testing, i.e., negative test today, does not mean negative tomorrow</li> </ul>	<ul style="list-style-type: none"> <li>• Use of appropriate level of filtration (HEPA or similar) or ventilation space treatment</li> <li>• Increased rotation days reduces the number of crew changes and reduces the number of personnel requiring pre-hitch quarantines, etc.</li> <li>• Reduce load on helicopters</li> <li>• Crossing state lines-approved by managed workers using company related documentation (e.g., letters)</li> <li>• App based, smart phone questionnaire process, not spreadsheet process</li> <li>• Improve scope of occupational medical surveillance to include related symptoms, such as hearing conservation, chemical exposure history, etc.</li> <li>• Daily temp check for first 3-days of each hitch (or every day for short-term workers) for all new arrivals, then weekly.</li> <li>• Perpetual/long-acting disinfection protocol/plan</li> <li>• Conduct quarantine drills to help site leaders better understand steps necessary to contain outbreaks</li> <li>• Mask requirement while in transit to/from location</li> <li>• Reinforce hygiene training and sanitation protocols</li> <li>• Continued screening at heliport/dock locations with follow-up wellness check at worksite locations</li> <li>• Antibody screening, where available, at heliport/dock locations</li> <li>• ‘Return to Work Criteria’ for employees and contractors with confirmed COVID-19 (tested)</li> <li>• ‘Return to Work Criteria’ for employees and contractors with suspected COVID-19 (untested)</li> </ul>

<sup>1</sup> The mitigation strategies listed represent a sampling and may not be applicable to all operators represented by the operational segment in which the strategy is listed.

Oil Value Chain Operational Segments	Operational Reality	Challenge	Mitigation Strategies <sup>1</sup>
<b>Drilling – Onshore</b>	<ul style="list-style-type: none"> <li>• Demand decrease</li> <li>• Reduced rig count</li> </ul>	<p><b>Logistics:</b></p> <ul style="list-style-type: none"> <li>• Transportation to drilling locations</li> <li>• State crossing restrictions</li> <li>• Reduced commercial aviation schedules for crew change</li> <li>• Shift (14 day on/off) schedules and crew impacts from illness</li> </ul> <p><b>PPE/Cleaning Supplies:</b></p> <ul style="list-style-type: none"> <li>• Access to PPE, disinfectant, other items to ensure safe work environment and response to suspected illness</li> </ul>	<ul style="list-style-type: none"> <li>• Increased rotation days to reduce the number of crew changes and the number of personnel requiring pre-hitch quarantines, etc.</li> <li>• Increased use of automation to reduce the number of personnel required on site.</li> <li>• Continue to defer non-essential activities</li> <li>• Work barriers placed in the “<a href="#">doghouse</a>”</li> <li>• Appropriate disinfection between shift changes</li> <li>• Maintain social distances when possible if not using masks</li> </ul>
<b>Production</b>	<ul style="list-style-type: none"> <li>• <a href="#">Shut in</a> of some production</li> </ul>	<p><b>Logistics:</b></p> <ul style="list-style-type: none"> <li>• State crossing restrictions</li> </ul>	<ul style="list-style-type: none"> <li>• Screening questionnaire prior to shift</li> <li>• Frac Command Center <ul style="list-style-type: none"> <li>○ disinfection of work stations after shifts (or utilize machine-covers that can be easily wiped down)</li> <li>○ HEPA air filter</li> <li>○ barriers separating works stations where social distancing is not possible or wearing masks</li> </ul> </li> </ul>
<b>Refining</b>	<ul style="list-style-type: none"> <li>• Spring turnarounds, which requires large volume of short-term contract employees</li> </ul>	<p><b>Logistics:</b></p> <ul style="list-style-type: none"> <li>• State crossing restrictions for workforce to get to the refineries</li> <li>• Vendor availability for key services such as inspection and specialty maintenance is questionable at times</li> <li>• Ensuring safety and health of workers at high-volume pedestrian entrance without impacting business needs to get workers to job site</li> </ul> <p><b>Social Distancing:</b></p> <ul style="list-style-type: none"> <li>• Social distancing is challenging during turnarounds given the volume of workers onsite</li> </ul> <p><b>PPE/Cleaning Supplies:</b></p> <ul style="list-style-type: none"> <li>• Access to masks and disinfectant for the large volume of short-term contract employees</li> </ul>	<ul style="list-style-type: none"> <li>• Screening questionnaire prior to shift</li> <li>• Increased number of buses to allow for proper social distancing when the contracted workforce is transported to and from the facility; use of masks</li> <li>• Staggered lunch times and large eating areas, where employees maintain social distancing</li> <li>• Temperature gate checks being performed (either by thermometer or in some cases by thermal cameras)</li> <li>• Proper PPE supplied according to CDC guidelines, taking into consideration</li> <li>• Proper and frequent cleaning and disinfecting protocols for workspaces</li> <li>• Open additional gates to the refinery to distribute concentrations of worker ingress/egress</li> </ul>
<b>Transportation – Pipeline, Marine, Motor, Rail</b>	<ul style="list-style-type: none"> <li>• Increased demand for trucking operations, which will require training new drivers and hands-on training</li> <li>• Many assets in remote locations</li> </ul>	<p><b>Logistics:</b></p> <ul style="list-style-type: none"> <li>• Maintenance and repair crews challenged when crossing states or localities with travel restrictions</li> <li>• Workforce optimization to cover large operational area</li> <li>• Ensuring workers with specialized qualifications or cannot work remotely (e.g., control room operators) are protected at work locations</li> </ul>	<ul style="list-style-type: none"> <li>• Use of screening questionnaires prior to shift</li> <li>• Self-screening measures for driver trainees</li> <li>• Partition drivers, contractors and delivery personnel from the facility personnel</li> <li>• Ensure personnel and vehicles are properly identified and carry appropriate travel documentation.</li> </ul>

<sup>1</sup> The mitigation strategies listed represent a sampling and may not be applicable to all operators represented by the operational segment in which the strategy is listed.

Oil Value Chain Operational Segments	Operational Reality	Challenge	Mitigation Strategies <sup>1</sup>
<b>Transportation – Pipeline, Marine, Motor, Rail</b> (cont'd)	(list continues from previous page) <ul style="list-style-type: none"> <li>Restarting maintenance and construction work deferred during height of pandemic</li> </ul>	(list continues from previous page) <b>Social Distancing:</b> <ul style="list-style-type: none"> <li>Social distancing is challenging for certain activities such as driver training</li> <li>Difficulty social distancing during some jobs requiring multiple operators in close quarters (down hole well inspections)</li> </ul> <b>PPE/Cleaning Supplies:</b> <ul style="list-style-type: none"> <li>Access to masks and disinfectant</li> </ul>	(list continues from previous page) <ul style="list-style-type: none"> <li>Prioritize essential work, explore technology-based alternatives where possible, and communicate new work plans with appropriate regulatory agencies</li> <li>Limit site access to essential workers, and separating essential workers into separate shifts and locations</li> <li>Work with federal and state governments to coordinate the flow of testing equipment and PPE to essential critical infrastructure workers</li> </ul>
<b>Storage &amp; Logistics</b>	<ul style="list-style-type: none"> <li>Increased volume of barge and truck operators</li> <li>Increased interactions with transportation companies – U.S. and foreign</li> <li>Clearing storage volumes before production and refining can come fully back on-line</li> <li>Decreased storage capacity due to increased supply accompanied by decreased demand for product</li> </ul>	<b>Logistics:</b> <ul style="list-style-type: none"> <li>Providing the right kind of storage where needed</li> <li>Continuing to meet safety and environmental needs such as driver safety training</li> <li>Inability to empty tanks of winter blend gasolines in order to fill them with summer gasolines</li> <li>Protection of terminal operators and tank truck drivers</li> <li>Critical vendors and supplies being stopped during state lockdowns</li> <li>Receiving domestic &amp; foreign vessels</li> </ul> <b>Social Distancing:</b> <ul style="list-style-type: none"> <li>Amplifying existing protective measures already in place</li> </ul> <b>PPE/Cleaning Supplies:</b> <ul style="list-style-type: none"> <li>Access to disinfectants, hand sanitizers, masks, nitrile gloves and thermometers</li> </ul> <b>Medical Capability/Capacity:</b> <ul style="list-style-type: none"> <li>Ambiguous and expansive list of Governor and Health Department executive orders</li> <li>Uncertain effectiveness of requirements for mandatory Active-Screening of employees</li> </ul>	<ul style="list-style-type: none"> <li>Use of in-service inspection of seals for internal floating roofs</li> <li>Adjust tank characteristics to increase working volumes in storage tanks</li> <li>COVID-19 screening of personnel coming into terminal</li> <li>Continued social distancing between drivers, operators and other employees</li> <li>Finding alternatives to direct contact for documentation, such as Product Transfer Documents (PTDs) and bills of lading</li> <li>Use of idled pipelines as short term storage</li> <li>Continued enforcement discretion from regulatory agencies to empty winter gasoline from the system to make way for summer gasoline</li> <li>Computer based/remote training</li> <li>Regular and repetitive cleaning of high touch surfaces</li> <li>Identify and assist vendors obtain travel documentation</li> <li>USCG approval of alternative means documenting vessel and transfers to limit person-to-person contact</li> <li>Monitor statewide and county executive orders</li> <li>Use of face-shields as a substitute to masks</li> <li>Implement contact tracing protocols</li> <li>Identify strike-teams to deploy and maintain critical operations</li> </ul>

<sup>1</sup> The mitigation strategies listed represent a sampling and may not be applicable to all operators represented by the operational segment in which the strategy is listed.

Oil Value Chain Operational Segments	Operational Reality	Challenge	Mitigation Strategies <sup>1</sup>
<b>Petroleum Marketing</b>	<ul style="list-style-type: none"> <li>• Inspections and certifications will resume</li> <li>• Increased demand for trucking operations, which will require training new drivers and hands-on training</li> <li>• More interaction at terminals</li> <li>• More replacement drivers needing to be carded, which requires on-site one-on-one training</li> <li>• Maintaining and revising anti COVID-19 procedures, where necessary</li> <li>• Revision or extension of protocols for customer interaction – for drivers and the heating oil and retail gasoline stations</li> </ul>	<p><b>Logistics:</b></p> <ul style="list-style-type: none"> <li>• Operators face unknown expectations from government as the backlog of inspections are addressed</li> <li>• State crossings restrictions</li> <li>• Need for agency enforcement discretion regarding the inability to empty tanks of winter blend gasoline in order to fill with summertime low RVP blends mandated by law</li> </ul> <p><b>Social Distancing:</b></p> <ul style="list-style-type: none"> <li>• Social distancing is challenging for certain activities such as driver training</li> </ul> <p><b>PPE/Cleaning Supplies:</b></p> <ul style="list-style-type: none"> <li>• Access to masks and disinfectant for replacement drivers (including heating fuel) being trained in order to be carded at specific terminals</li> <li>• AC &amp; heating fuel technicians need access to N95 masks, face shields, and goggles since they go into homes to make repairs</li> </ul>	<ul style="list-style-type: none"> <li>• Agency discretion extending inspections and certification renewal dates may be required</li> <li>• Screening questionnaires for drivers</li> <li>• Drivers discouraged from entering the stores during unloading time</li> <li>• Pens used for signing paperwork are not shared and are disinfected after every use</li> <li>• Drivers that share trucks and trailers disinfect all</li> <li>• Routine cleaning of frequently touched surfaces with disinfectant spray throughout a driver shift</li> <li>• Customers should wear masks, should not interface with the technician, and stay in another room</li> <li>• Handle billing and receipts electronically</li> </ul>

Table 2 is a matrix of the different segments of the natural gas value chain and associated challenges confronting each for responsible recovery.

Natural Gas Value Chain Operational Segments	Operational Reality	Challenge	Mitigation Strategies <sup>1</sup>
<b>Drilling &amp; Production</b>	Refer to oil value chain onshore and offshore drilling and production	Refer to oil value chain onshore and offshore drilling and production	Refer to oil value chain onshore and offshore drilling and production
<b>Transmission &amp; Storage</b>	<ul style="list-style-type: none"> <li>• Many assets in remote locations</li> <li>• Restarting maintenance and construction work deferred during height of pandemic</li> </ul>	<p><b>Logistics:</b></p> <ul style="list-style-type: none"> <li>• Workforce optimization for large operational area coverage</li> <li>• Ensuring that essential workers with specialized qualifications who cannot work remotely (e.g., control room operators) are protected at work locations</li> </ul> <p><b>Social Distancing:</b></p> <ul style="list-style-type: none"> <li>• Difficulty social distancing during some jobs requiring multiple operators in close quarters (down hole well inspections)</li> </ul> <p><b>PPE/Cleaning Supplies:</b></p> <ul style="list-style-type: none"> <li>• Access to COVID-19 testing, facial coverings, disinfectant, thermometers, and other safety and health supplies</li> </ul>	<ul style="list-style-type: none"> <li>• Prioritize essential work, explore technology-based alternatives where possible, and communicate new work plans with appropriate regulatory agencies</li> <li>• Limit site access to essential workers, and separating essential workers into separate shifts and locations</li> <li>• Work with federal and state governments to coordinate the flow of testing equipment and PPE to essential critical infrastructure workers</li> </ul>

<sup>1</sup> The mitigation strategies listed represent a sampling and may not be applicable to all operators represented by the operational segment in which the strategy is listed.

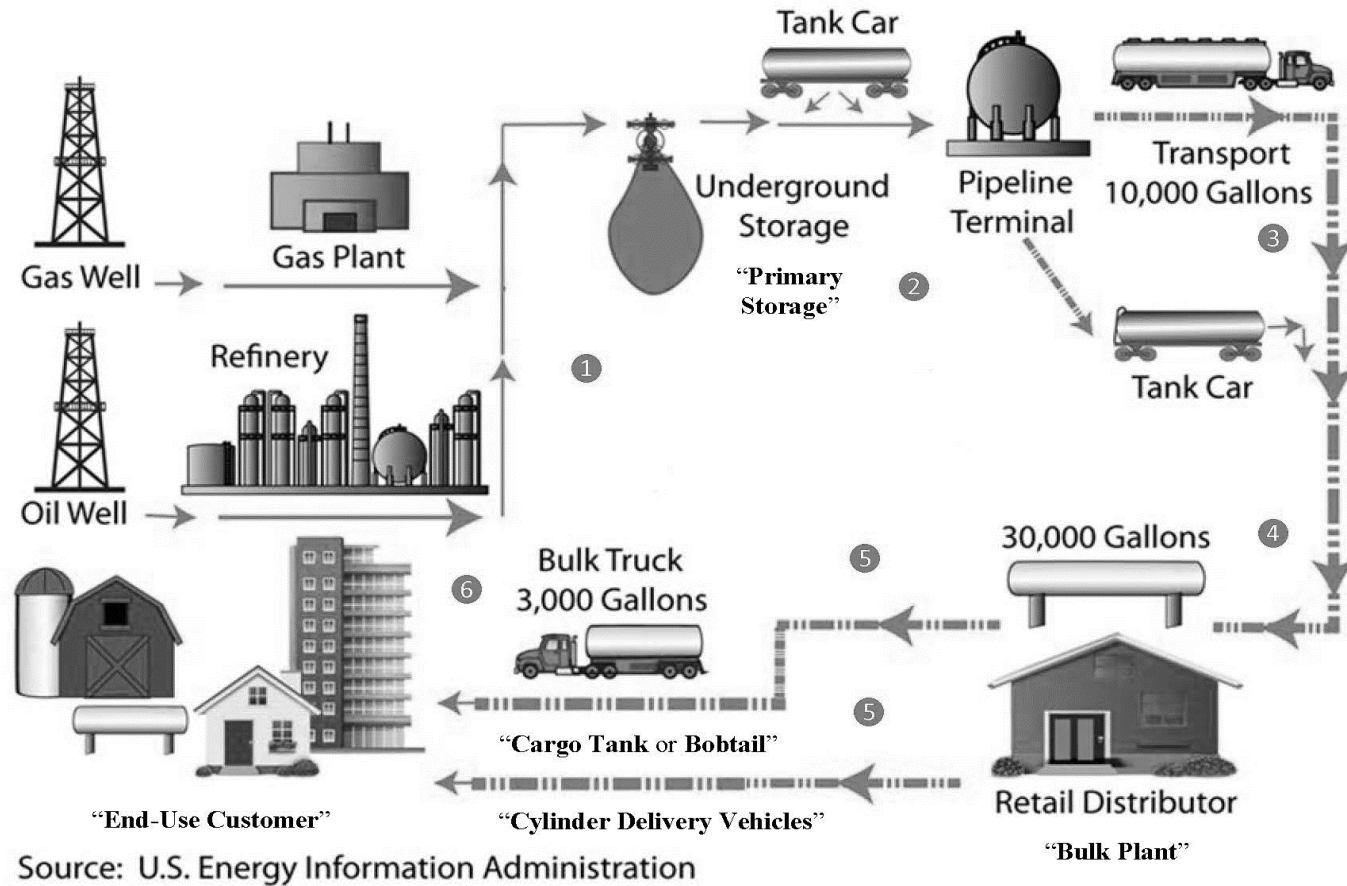


Natural Gas Value Chain Operational Segments	Operational Reality	Challenge	Mitigation Strategies <sup>1</sup>
<b>Distribution</b>	<ul style="list-style-type: none"> <li>Increased direct interface with customers and access to residence (e.g., odor and leak investigation, meter maintenance, corrosion assessment)</li> <li>Restarting deferred service work that requires access to customer residence</li> <li>Restarting capitol work (e.g., accelerated main replacement programs)</li> <li>Increased volume of 8-1-1 tickets and reduced staff to handle tickets</li> <li>Control room management with increased volume of employees (available PPE, designated entry way and office space)</li> <li>Shutting off and turning back on customer service for completion of maintenance projects</li> <li>Coordinating with other utilities or public services (e.g. highway departments) to complete maintenance and sometimes capital projects</li> <li>Opening customer service centers, as stay-at-home orders in states are lifted</li> <li>Installing appliances in customer homes</li> </ul>	<p><b>Logistics:</b></p> <ul style="list-style-type: none"> <li>Residential access restrictions enforced by homeowner preventing gas service to complete project or conduct leak/odor investigation</li> <li>Potential supply chain impact on parts requiring long lead time (ex: large fittings, valves)</li> <li>Limited availability of contractors that perform specialized tasks (e.g., in-line inspections, high pressure main stop-offs, tapping, stopple fitting)</li> <li>Increase potential for third-party excavation damage from third-parties not willing to wait for line marking</li> </ul> <p><b>Social Distancing:</b></p> <ul style="list-style-type: none"> <li>Social distancing of utility crews en route to worksite</li> <li>Social distancing during some jobs requiring multiple operators in close quarters (leak repair, main tie-ins, vault maintenance)</li> </ul> <p><b>PPE/Cleaning Supplies:</b></p> <ul style="list-style-type: none"> <li>Access to FR-rated masks for field service technicians conducting leak investigations and field crews working in physically close environments</li> <li>Access to hand sanitizer</li> </ul>	<ul style="list-style-type: none"> <li>Increase public awareness and communication of the shortage of staffing resources for conducting 8-1-1 line locates and longer-than normal ticket response time</li> <li>Outreach with local and state authorities regarding the utility's phase in plan, including PPE challenges and accompanying implications</li> <li>Equip customer service representatives with scripts to better inform the customer of expectations in advance of the field technician arrival; also prepare field technician with talking points</li> <li>Identify alternate mechanisms in place of crossing the residential threshold for monitoring the pipeline system</li> <li>Construction crews continue to take separate trucks</li> <li>Leverage communication technology for remote access and resolution rather than onsite work</li> <li>Identify control room tasks that may be remotely monitored (e.g., responding to alarms)</li> <li>Reprioritize discretionary work to address resource challenges and training constraints</li> <li>Reassign work duties to operator qualified personnel (contractor and company), as appropriate</li> <li>Bring back retired personnel (e.g., retired Quality Assurance manager)</li> <li>Reprioritize integrity management-related leak repairs as appropriate</li> <li>Reduce the number of contractors working on system; minimizes exposure while allowing work to continue</li> <li>Install barriers, such as plexiglass, between customer and utility worker</li> <li>Customer interactions limited to drive-through service</li> <li>Electronic billing</li> <li>Use of masks when requesting residential access</li> <li>Follow CDC recommended hygienic protocols prior and post entry</li> </ul>
<b>Supplemental Gas</b>			
<b>LNG/LPG</b>	<ul style="list-style-type: none"> <li>Yearly Maintenance</li> <li>Refueling</li> <li>Daily operations</li> </ul>	<p><b>Logistics:</b></p> <ul style="list-style-type: none"> <li>Availability and willingness of LNG resupply tankers</li> <li>Ordering spare/repair parts</li> </ul> <p><b>Social Distancing:</b></p> <ul style="list-style-type: none"> <li>Refueling LNG or propane tanks requiring interaction with tanker driver</li> <li>Sharing of fueling hose</li> </ul>	<ul style="list-style-type: none"> <li>Implement refueling social distancing and cleaning guidelines</li> </ul>

<sup>1</sup> The mitigation strategies listed represent a sampling and may not be applicable to all operators represented by the operational segment in which the strategy is listed.

## Oil & Natural Gas COVID-19 Responsible Recovery Compendium Appendix B – Propane

Figure 3: Operational Segments of Propane Distribution Path



\*NPGA modified original pictogram to describe the odorization of propane. Energy Information Administration, Propane Explained, *Delivery and Storage of Propane* (Nov. 26 2012), [http://www.eia.gov/energyexplained/index.cfm?page=propane\\_delivery](http://www.eia.gov/energyexplained/index.cfm?page=propane_delivery).

Table 3 is a matrix of the different segments associated with propane and challenges confronting each for responsible recovery.

Propane	Operational Reality	Challenge	Mitigation Strategies <sup>1</sup>
Production	Refer to oil and natural gas value chain onshore drilling, production, and refining	Refer to oil and natural gas value chain onshore drilling, production, and refining	Refer to oil and natural gas value chain onshore drilling, production, and refining
Transportation (pipeline, marine, motor, rail)	<ul style="list-style-type: none"> <li>• Increase in demand for drivers to access production</li> <li>• New drivers will require appropriate CDL endorsements (i.e., hazardous materials, tank trucks), which requires assessments by State Driver License Agencies and anti-terrorism screening required by the Transportation Security Administration</li> </ul>	<p><b>Logistics:</b></p> <ul style="list-style-type: none"> <li>• Current nationwide driver shortage</li> <li>• State-by-state determination of operating procedures for State Driver License Agencies, including state determinations on the expiration and renewal of CDL endorsements as well as issuing new endorsements and commercial driver licenses</li> <li>• State and local determinations on re-entry procedures to areas where product supply points are located</li> </ul> <p><b>PPE/Cleaning Supplies:</b></p> <ul style="list-style-type: none"> <li>• Access to masks and disinfectant for common carrier trucking operations that are independent contractors from propane operations</li> </ul>	<ul style="list-style-type: none"> <li>• Utilization of the Commercial Routing Assistance tool created by the Cybersecurity &amp; Infrastructure Security Agency and the Idaho National Laboratory to identify available routes, rest areas, state and local travel restrictions, and operating State Driver License Agency offices</li> <li>• Routine communication with supply points regarding operating status and access restrictions</li> <li>• Review of any updates or additional distribution points of facial masks or other PPE by the Federal Motor Carrier Safety Administration</li> </ul>
Storage (secondary and tertiary storage locations)	<ul style="list-style-type: none"> <li>• Access according to travel restrictions at state and local levels</li> <li>• Increased interaction with facility personnel and end-use customers</li> </ul>	<p><b>Social Distancing:</b></p> <ul style="list-style-type: none"> <li>• Social distancing limited due to operational demands and safety requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Increase PPE and sanitization of common equipment</li> </ul>
Service	<ul style="list-style-type: none"> <li>• Backlog of maintenance and construction work</li> <li>• Customers and assets in remote locations</li> <li>• Installation of tanks, equipment and appliances at customer locations</li> <li>• Ongoing odor and leak investigations at residential and commercial operations</li> </ul>	<p><b>Logistics:</b></p> <ul style="list-style-type: none"> <li>• Residential access restrictions enforced by homeowner</li> </ul> <p><b>Social Distancing:</b></p> <ul style="list-style-type: none"> <li>• State and local social distancing and preventative measures unique to multiple locations throughout a state and/or region</li> </ul>	<ul style="list-style-type: none"> <li>• Prioritize work and correlate with phase-in notices by state and local authorities</li> <li>• Work with Federal and state governments to coordinate PPE to essential critical infrastructure workers</li> </ul>

<sup>1</sup> The mitigation strategies listed represent a sampling and may not be applicable to all operators represented by the operational segment in which the strategy is listed.