

**BEFORE THE**  
**PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION**

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**In re:**

**Petition for Rulemaking  
to Amend the Requirements for  
the Operation of High-Hazard  
Flammable Trains Under  
49 C.F.R. Part 174**

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**PHMSA Docket No. \_\_\_\_**

**PETITION FOR RULEMAKING**

**STATE OF NEW YORK  
OFFICE OF THE ATTORNEY GENERAL**

Dated: December 1, 2015

## INTRODUCTION

Pursuant to the Administrative Procedure Act, 5 U.S.C. § 553(e), the federal Hazardous Materials Transportation Act, 49 U.S.C. §§ 5101 – 5128, and 49 C.F.R. Part 106, Subpart B, the New York State Attorney General’s Office submits this petition for rulemaking to establish a nationwide vapor pressure standard for crude oil shipped by rail throughout the United States. The requested rule would apply to crude oil shipped by rail from all sources, including from the Bakken Shale of North Dakota. The transportation via train of crude oil, including highly volatile Bakken crude oil, endangers residents, first responders, businesses, and natural resources across the nation. At present, no federal regulation exists to limit the volatility of crude oil shipped in railroad tank cars. This petition for rulemaking seeks to close that loophole and reduce the risk of harm to American communities.

The high volatility of certain forms of crude oil, and of Bakken crude oil in particular, has contributed to the large explosions and severe fires that have resulted from train crashes and derailments in recent years. These events have become more common as the volume of crude oil shipped by rail has expanded in the United States. Technology exists today that is widely used in some parts of the country that can stabilize the volatile crude oil to render the material less explosive and less flammable in the event of an accident. Given the large numbers of crude oil trains on U.S. railroads, the thousands of miles of railroad that these trains travel each day, and the inherently volatile nature of Bakken crude oil, incidents such as the explosion in Lac-Mégantic, Quebec, which destroyed the town and killed 47 people, may well recur unless federal standards are imposed to limit the volatility of crude oil.

The Pipeline and Hazardous Materials Safety Administration (“PHMSA”), in coordination with the Federal Railroad Administration (“FRA”), recently promulgated a rule to address certain safety concerns that emerged from a series of train accidents involving Bakken

crude oil. Although the rulemaking does impose some needed safeguards for railroad tank cars, it does not address the primary cause of the large explosions and uncontrollable fires in these train accidents – the volatility of crude oil itself – due to the abundance of combustible gases within the material. As the federal government acknowledges, despite its recent rulemaking, large accidents will still occur, leading to devastating safety consequences and inflicting substantial economic costs on communities located near rail lines.

To protect our communities and our environment in which these accidents could occur, it is important to limit the volatility of the crude oil itself. Through this petition for rulemaking, the Office of the New York State Attorney General requests that PHMSA assert its rulemaking authority, as delegated by the Secretary of Transportation, and establish a federal Reid vapor pressure limit for crude oil transported by rail in the United States at an appropriate level that is less than 9.0 pounds per square inch (“psi”).

### **PETITIONER’S INTEREST IN THE RULEMAKING**

Approximately 20 percent of Bakken crude oil shipped by rail from North Dakota passes through the State of New York.<sup>1</sup> These trains are routed through the midwest United States, through major New York metropolitan areas in Buffalo, Syracuse, Rochester, Schenectady, and Albany, to receiving, storage, and shipping terminals including those at the Port of Albany.<sup>2</sup> There, shipping companies such as Global Energy Partners and Buckeye Partners move the crude oil down the Hudson River by rail and barge en route to refineries along the East Coast and in Canada.<sup>3</sup> A rail tank car explosion or fire along these routes of the size and intensity of those in

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<sup>1</sup> See Mouawad, J., “Bakken Crude, Rolling Through Albany,” *N.Y. Times*, Feb. 27, 2014.

<sup>2</sup> See “Transporting Crude Oil in New York State: A Review of Incident Prevention and Response Capacity,” at 16, available at: <http://www.eli.org/sites/default/files/docs/nyscrudeoilreport.pdf>.

<sup>3</sup> See *id.*

recent events would imperil the safety and welfare of thousands of New York State residents who live, work, travel, and recreate along the way. In addition, explosions and the release of large quantities of oil may threaten nearby property and infrastructure as well as the environmental health of wetlands, rivers, drinking water resources, and wildlife habitats through which these trains travel.

### **RELEVANT FACTS**

#### **A. Shipments of Bakken crude oil by rail are vastly expanding**

The United States is experiencing a boom in crude oil production. In October 2013, U.S. crude oil production exceeded imports for the first time since February 1995.<sup>4</sup> In 2014, crude oil, along with natural gas, accounted for more than 60% of the total energy production of the United States, and has played a major role in driving an overall expansion of energy production.<sup>5</sup> According to data collected by the U.S. Energy Information Administration (“EIA”), this trend has continued into 2015, despite price competition from other sources. EIA calculates that domestic crude oil production for 2015 has outpaced production for 2014, and for the week ending October 23, 2015, was 9.1 million barrels per day, up from 8.6 million barrels a day one year ago.<sup>6</sup> Sustained crude oil production through the remainder of the year would equal production levels not seen since 1970.<sup>7</sup> Despite competition from other energy sources and

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<sup>4</sup> “US Crude Production Tops Imports For The First Time Since 1995,” *Oil Daily*, Nov. 14, 2013.

<sup>5</sup> See U.S. Energy Information Administration, “Primary Energy Consumption by Source and Sector, 2014,” available at: [http://www.eia.gov/totalenergy/data/monthly/pdf/flow/css\\_2014\\_energy.pdf](http://www.eia.gov/totalenergy/data/monthly/pdf/flow/css_2014_energy.pdf).

<sup>6</sup> Energy Information Administration, U.S. Crude Oil Domestic Production, Oct. 28, 2015 (release date).

<sup>7</sup> Energy Information Administration, U.S. Field Production of Crude Oil, Oct. 30, 2015 (release date).

falling prices, EIA forecasts crude oil production in the United States to remain high, estimating an output of 9.25 million barrels per day in 2015, and 8.86 million barrels per day in 2016.<sup>8</sup>

The rapid growth of crude oil production in the Bakken Shale formation of North Dakota has been a key element of the U.S. energy boom. This production has escalated rapidly in only a few short years. Between 2005 and 2014, North Dakota increased oil production more than 10 times, and now ranks behind only Texas in domestic production.<sup>9</sup> Though only small amounts of Bakken crude oil were produced in the early 1980s, oil production from this region now accounts for more than 12 percent of total crude oil production in the United States.<sup>10</sup> Despite falling prices, oil production in the Bakken Shale remains strong and in August 2015, the Bakken Shale recorded its 18th straight month of production exceeding 30 million barrels per month.<sup>11</sup> Current forecasts predict strong production of crude oil will continue in the Bakken Shale.<sup>12</sup>

Crude oil is traditionally transported from extraction well to refinery in the United States by pipeline and shipping barge. The nation's enormous increase in crude oil production, however, has increasingly lead oil shippers to turn to rail as an alternative means to reach U.S. markets.<sup>13</sup> The vast reach of the U.S. rail network provides flexibility to oil shippers and a transportation option in areas with limited pipeline or barge capacity. Indeed, the rail network in

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<sup>8</sup> Energy Information Administration, Short-Term Energy and Winter Fuels Outlook, Oct. 6, 2015 (release date).

<sup>9</sup> Energy Information Administration, Monthly Crude Oil Production, Oct. 30, 2015 (release date).

<sup>10</sup> *Id.*

<sup>11</sup> *Id.*

<sup>12</sup> Energy Information Administration, Short-Term Energy and Winter Fuels Outlook, Oct. 6, 2015 (release date).

<sup>13</sup> See David, J., "In Moving US Oil, 'Flexible' Rail Bests Pipelines," CNBC, *available at*: <http://www.cnbc.com/id/100831924>.

the United States is more extensive than its pipeline infrastructure: compared to about 140,000 miles of railroad, the United States has only 61,000 miles of crude oil pipelines.<sup>14</sup>

With the increase in crude oil production, shipments of crude oil by rail have experienced a large increase. U.S. freight railroads delivered 435,560 carloads of crude oil in 2013, compared to only 9,500 carloads in 2008, and the volume of crude oil carried by rail increased 20 times during that period.<sup>15</sup> In the first half of 2014, almost 260,000 carloads of crude oil were delivered, marking a nine percent increase compared with the same period in 2013.<sup>16</sup> Rail carloads of crude oil are expected to remain at this level over the next 20 years.<sup>17</sup> Of course, the nation's railroads exist for more than the transportation of crude oil alone. Many of the same rail corridors are used for passenger transport,<sup>18</sup> for the shipment of chemicals,<sup>19</sup> and for the transport of hazardous waste, potentially including spent nuclear fuel.<sup>20</sup>

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<sup>14</sup> See "U.S. Rail Transportation of Crude Oil: Background and Issues for Congress," Congressional Research Service, December 4, 2014, at 5.

<sup>15</sup> See "Rail deliveries of U.S. oil continue to increase in 2014, U.S. Energy Information Administration, August 28, 2014, *available at*: <http://www.eia.gov/todayinenergy/detail.cfm?id=17751>.

<sup>16</sup> See "Rail deliveries of U.S. oil continue to increase in 2014, U.S. Energy Information Administration, Aug. 28, 2014, *available at*: <http://www.eia.gov/todayinenergy/detail.cfm?id=17751>.

<sup>17</sup> See 80 Fed. Reg. No. 89, 26644, at 26720 (May 8, 2015).

<sup>18</sup> According to Amtrak, on an average day 84,000 people ride 300 Amtrak trains. See Amtrak National Fact Sheet: FY 2014 (Amtrak Media Relations: September 2015). Amtrak passenger trains use railroads owned by BNSF Railroad, Union Pacific Railroad, CSX Transportation, Norfolk Southern Railway, among other companies. *Id.*

<sup>19</sup> See, e.g., J. Laday, "500 Evacuated in wake of derailment," *South Jersey Times*, Dec. 2, 2012, reporting on the forced evacuation of residents living in the vicinity of a train derailment and bridge collapse that left vinyl chloride, a toxic chemical, leaking into the Mantua Creek; A. Connolly, "Thousands of evacuees to return home after Tenn. train derailment," *United Press Int'l*, July 3, 2015 ("Thousands of evacuees will likely be allowed to return home Friday, more than 24 hours after a freight train carrying a poisonous liquid derailed and burst into flames, sending plumes of toxic gas into the air and possibly the groundwater.").

<sup>20</sup> For example, approximately 70,000 metric tons of radioactive spent nuclear fuel resides at U.S. power plants, which may be transported by rail in the coming years. The U.S. Department of Energy estimated that it would take 9,500 rail shipments over 50 years to transport that quantity of spent fuel to a national disposal site – if one is constructed and licensed to operate. See DOE/EIS-0369D, Draft Environmental Impact Statement for a Rail Alignment for the Construction and Operation of a Railroad in Nevada to a Geologic Repository at Yucca Mountain, Nye County, Nevada, at S-32 (Oct. 2007).

In North Dakota, the rapid growth in Bakken crude oil production has followed a similar transportation trend. In 2009, 73 percent of crude oil produced in the Bakken Shale moved by pipeline, with only one percent transported by rail.<sup>21</sup> By December 2012, 66 percent of crude oil produced in North Dakota was transported out of the State via rail.<sup>22</sup> This rate continued into 2014.<sup>23</sup> The rapid growth in Bakken crude oil production has placed a strain on the capacity of existing pipelines and has significantly outpaced the installation of new pipelines.

When transported by rail, crude oil and other highly-flammable liquids are loaded into two types of railroad tank cars. One type, the DOT Specification-111 tank cars (“DOT-111”), are made of steel plate, less than a half-inch thick, with optional insulation.<sup>24</sup> In 2011, the American Association of Railroads issued specifications for new Casualty Prevention Circular (CPC)-1232 compliant DOT-111 tank cars (“CPC-1232”), intended to improve the crashworthiness of the tank cars by including a thicker shell, head protection, top fittings protection, and pressure relief valves with a greater flow capacity.<sup>25</sup> The safety record of both types of these tank cars in derailments, however, confirms the need for a protective vapor pressure standard. The National Transportation Safety Board (“NTSB”) has stated that the DOT-111 tank car can “almost always be expected to breach in the event of a train accident resulting

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<sup>21</sup> See Williams, M., “The New Transportation of Crude Oil: Planes, Trains, and Automobiles,” Second quarter 2013, *available at*: <https://www.bbh.com/wps/wcm/connect/bec7e5004f487efea2b5f76aa46af24d/The+New+Transportation+of+Crude+Oil.pdf>.

<sup>22</sup> See *id.*

<sup>23</sup> See “Rail deliveries of U.S. oil continue to increase in 2014, U.S. Energy Information Administration, Aug. 28, 2014, *available at*: <http://www.eia.gov/todayinenergy/detail.cfm?id=17751>.

<sup>24</sup> See 49 C.F.R. § 179.200-201.

<sup>25</sup> See 80 Fed. Reg. 26644, at 26654.

in car-to-car impacts or pileups.”<sup>26</sup> NTSB has also stated that the CPC-1232 design is only “marginally improved” over its predecessor DOT-111 design.<sup>27</sup> Despite this, in 2014, FRA stated in a response to Congress that it saw “no need” to full-scale crash-test train cars built to the CPC-1232 specification.<sup>28</sup>

After it is loaded into railroad tank cars, crude oil from North Dakota is shipped hundreds to thousands of miles by rail to reach refineries across the United States.<sup>29</sup> A significant amount is delivered to refineries in the east coast. For its part, over 80 percent of the crude oil received by the east coast by rail appears to come from North Dakota.<sup>30</sup> Albany, New York, is the site of one of ten operating crude oil unloading rail terminals in the main east coast region. At the Port of Albany, two operators, Global Energy Partners and Buckeye Partners, transfer incoming crude oil from railcars to barges that then travel down the Hudson River to refineries.<sup>31</sup> During transport, DOT-111 and CPC-1232 tank cars are commonly assembled into so-called “unit trains” of between 70 and 120 tank cars, which together, in a single train, can transport between 50,000 to 90,000 barrels, or two million to more than 3.5 million gallons, of crude oil.<sup>32</sup> By design, a unit train will carry a single type of cargo in a single type of tank car, and will serve a

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<sup>26</sup> See National Transportation Safety Board, Railroad Accident Report - Derailment of CN Freight Train U70691-18 With Subsequent Hazardous Materials Release and Fire, June 19, 2009, *available at*: <http://www.nts.gov/investigations/AccidentReports/Reports/RAR1201.pdf>.

<sup>27</sup> See Sobczak, B., “Federal regulators saw ‘no need’ to perform crash test on newer oil tank cars,” *EnergyWire*, E&E Publishing, LLC, March 23, 2015, *available at*: <http://www.eenews.net/energywire/stories/1060015497>.

<sup>28</sup> *Id.*

<sup>29</sup> See Energy Information Administration, “Movements of Crude Oil by Rail,” Oct. 30, 2015 (release date).

<sup>30</sup> “Crude-By-Rail Data Focus: U.S. East Coast: a Key Destination for North American Crude-by-Rail,” Oil Change International, July 2015, at 3-5.

<sup>31</sup> See “Transporting Crude Oil in New York State: A Review of Incident Prevention and Response Capacity,” at 16, *available at*: <http://www.eli.org/sites/default/files/docs/nyscrudeoilreport.pdf>.

<sup>32</sup> See “U.S. Rail Transportation of Crude Oil: Background and Issues for Congress,” *Congressional Research Service*, December 2, 2014, at 7.

single destination.<sup>33</sup> This design has the effect of concentrating large volumes of potentially harmful and flammable materials, such as Bakken crude oil, and increasing the likelihood of large fires and explosions should an accident occur.

### **B. A disturbing trend of train explosions involving shipments of Bakken crude oil**

The rise of Bakken crude oil transport by rail has given rise to a growing number of high-profile train accidents, which include the following:

- Lac-Mégantic, Quebec (July 2013): A derailed 72-car train carrying oil from the Bakken Shale burst into flames, killing 47 people, destroying buildings in downtown Lac-Mégantic, and spilling more than 1.3 million gallons of crude oil.<sup>34</sup> All 72 cars were built to DOT-111 specifications, and almost all of the 63 derailed tank cars were damaged or had large breaches.
- Aliceville, AL (November 2013): Twenty-five of 90 DOT-111 train cars derailed and a number were on fire days later, sending flames hundreds of feet high that could be seen from over 10 miles away.<sup>35</sup> Crude oil spilled into an adjacent wetlands area that feeds into the Tombigbee River. The train was traveling slower than the 40-mph limit on a track that had been recently inspected.
- Casselton, ND (December 2013): A 106-car train collided with another derailed train, igniting a “giant fireball” with flames more than 100 feet high, spilling 400,000 gallons of crude oil that fueled the fire, and requiring mass evacuation.<sup>36</sup>

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<sup>33</sup> *See id.*

<sup>34</sup> *See* Railway Investigation Report R13D0054, Transportation Safety Board of Canada (2014), *available at*: <http://www.tsb.gc.ca/eng/rapports-reports/rail/2013/r13d0054/r13d0054-r-es.pdf>.

<sup>35</sup> Gates, V. and McAllister, E., “Crude oil tank cars ablaze after train derails in Alabama,” *Reuters*, Nov. 8, 2013, *available at*: <http://www.reuters.com/article/2013/11/09/us-crude-train-explosion-idUSBRE9A70Q920131109>.

<sup>36</sup> Silva, D., “Mile-long train carrying crude oil derails, explodes in North Dakota,” *NBC News*, Dec. 30, 2013, *available at*: [http://usnews.nbcnews.com/\\_news/2013/12/30/22113442-mile-long-train-carrying-crude-oil-derails-explodes-in-north-dakota](http://usnews.nbcnews.com/_news/2013/12/30/22113442-mile-long-train-carrying-crude-oil-derails-explodes-in-north-dakota).

- Lynchburg, VA (April 2014): A derailment of 17 CPC-1232 cars resulted in explosions and fires despite traveling at only about 24 mph.<sup>37</sup> The derailment caused nearly 30,000 gallons of crude oil to be released in and around the James River, and caused three trains to derail into the river, leading state regulators to impose a \$361,000 civil fine against CSX Transportation, Inc.<sup>38</sup>
- Mt. Carbon, WV (February 2015): A derailment of a CSX Corp. train consisting of newer CPC-1232 tank cars caused 20 cars to catch fire and one tank car to derail into the Kanawha River, destroying one house, requiring the evacuation of 300 people, and causing the release of hazardous materials from those train cars, before burning out several days later.<sup>39</sup> The train was traveling at approximately 33 mph when 28 tank cars derailed.<sup>40</sup>
- Galena, IL (March 2015): A derailment of six of 103 tanker cars carrying Bakken crude caused fires and explosions only a few miles from the home of former U.S. President Ulysses S. Grant.<sup>41</sup> The event involved a train traveling only about 23 mph and consisting of newer CPC-1232 tank cars.<sup>42</sup>
- Heimdal, ND (May 2015): A BNSF train derailment resulted in an explosion and the evacuation of a North Dakota town. The 109-car train had unjacketed CPC-1232 train cars that were all built after 2011.<sup>43</sup>

These accidents, all involving crude oil being shipped from the Bakken Shale, are not common for trains shipping other forms of crude oil.<sup>44</sup> Each of these incidents, triggered by train derailments and collisions, resulted in significant explosions and giant fireballs and led to

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<sup>37</sup> Morris, B. and L. Stevens, "Oil Train That Crashed In Lynchburg Was Moving Below New Speed Limit," *Wall Street Journal*, May 1, 2014.

<sup>38</sup> See State Water Control Board Enforcement Action – Order by Consent, Issued to CSX Transportation, Inc., available at: <http://www.deq.virginia.gov/Portals/0/DEQ/Enforcement/Public%20Notice%20RP%20Signed%20Orders/CSX%20order%20signed%203Feb2015.pdf>

<sup>39</sup> McAllister, E., "Derailed CSX train in West Virginia hauled newer-model train cars," *Reuters*, Feb. 17, 2015.

<sup>40</sup> See Federal Railroad Administration, FRA Emergency Order No. 30, Notice No. 1, at 5, Apr. 24, 2015 (effective).

<sup>41</sup> "BNSF: Oil train derailment near Galena involved safer tank cars," *Chicago Tribune*, March 6, 2015, available at: <http://www.chicagotribune.com/news/local/breaking/chi-galena-train-derailment-20150305-story.html>.

<sup>42</sup> See Federal Railroad Administration, FRA Emergency Order No. 30, Notice No. 1, at 6, Apr. 24, 2015 (effective).

<sup>43</sup> Mouawad, J., "Oil Tank Car Fire Forces Evacuation of North Dakota Town," *N.Y. Times*, May 6, 2015.

<sup>44</sup> See, e.g., Final Regulatory Impact Analysis [Docket No. PHMSA-2012-0082] (HM-251) Hazardous Materials: Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains, at 299-300 (May 2015) ("PHMSA Regulatory Impact Analysis").

uncontrollable fires that often left responders with no choice but to wait days for the fires to burn out. The size and intensity of the fires in these incidents forced emergency responders to evacuate nearby towns, and caused destruction to nearby property, releases of crude oil into waterways and sensitive environmental areas, and, tragically, at Lac-Mégantic, the loss of human life. Each accident involved DOT-111 and CPC-1232 train cars, and in some cases, led to the release of hundreds of thousands of gallons of crude oil into the surrounding environment. The volume of oil released in these accidents is large, for example, 1.3 million gallons at the Lac-Mégantic accident, and 400,000 gallons at Casselton, ND. In comparison, a 2014 spill of oil into the Elk River north of Charleston, West Virginia – which made national headlines and left thousands without drinking water for days – involved a spill of 10,000 gallons.<sup>45</sup> Although none of these train accidents occurred in densely populated areas or major cities, each day, thousands of train cars carrying the same crude oil from the Bakken Shale pass through towns and cities across the United States.

### **C. Bakken crude oil is highly volatile and extremely flammable**

Traded as North Dakota Light, crude oil from the Bakken Shale is classified as a “light sweet” crude oil, and is a mixture of oil and highly volatile organic compounds that include propane, butane and ethane.<sup>46</sup> Compared to so-called “heavy” crude oils, Bakken crude oil has a higher concentration of these light-end volatile compounds.<sup>47</sup> At low temperatures, these volatile propanes, butanes and ethanes are largely dissolved in oil, but, due to their high volatility, have a strong tendency to change from liquid form into vapor within the tank cars as

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<sup>45</sup> See “Freedom revises spill estimate,” West Virginia Department of Environmental Protection, January 27, 2014.

<sup>46</sup> See Andrews, A., “Crude Oil Properties Relevant to Rail Transport Safety: In Brief,” Congressional Research Service, February 18, 2014.

<sup>47</sup> *Id.*

temperatures rise. In vapor form, these compounds are extremely flammable. Tank cars loaded with Bakken crude will ignite, burn, and explode more readily and at a lower temperature than tank cars containing other forms of crude oil.<sup>48</sup>

The high volatility and flammability of Bakken crude oil compared to other forms of crude oil has been confirmed. PHMSA, in its “Operation Safe Delivery” initiative, determined that Bakken crude “is more volatile than other forms of crude.”<sup>49</sup> PHMSA classifies Bakken crude oil as a Class 3 flammable liquid.<sup>50</sup> An analysis by the *Wall Street Journal* concluded that crude oil from the Bakken Shale formation contains “several times the combustible gases as oil from elsewhere.”<sup>51</sup> The consequence of these characteristics is that, when being shipped by rail, Bakken crude oil has a high tendency to ignite, burn, and explode when a tank car ruptures from a derailment or is exposed to fire.

Attention has converged on the volatility of Bakken crude oil due to the concerns raised by the intense explosions involving Bakken crude oil in recent train accidents. The volatility of a crude oil is measured by its vapor pressure, or its tendency to evaporate. Vapor pressure is commonly measured as “Reid vapor pressure” under certain standardized conditions.<sup>52</sup> In the case of crude oil, Reid vapor pressure can serve as an indicator of the liquid’s tendency to emit

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<sup>48</sup> The flammability of a liquid can be measured as its flash point, which is the temperature at which the liquid emits enough flammable vapors to ignite in the presence of air and an ignition source. *Id.* A lower flash point indicates a more flammable liquid. Bakken crude oil has a flash point of 95 °F, which is lower than many other forms of crude oil. *Id.*

<sup>49</sup> “Operation Safe Delivery Update,” Pipeline and Hazardous Materials Safety Administration, at 16, *available at*: [http://www.phmsa.dot.gov/pv\\_obj\\_cache/pv\\_obj\\_id\\_8A422ABDC16B72E5F166FE34048CCCBFED3B0500/filename/07\\_23\\_14\\_Operation\\_Safe\\_Delivery\\_Report\\_final\\_clean.pdf](http://www.phmsa.dot.gov/pv_obj_cache/pv_obj_id_8A422ABDC16B72E5F166FE34048CCCBFED3B0500/filename/07_23_14_Operation_Safe_Delivery_Report_final_clean.pdf).

<sup>50</sup> *See* 49 C.F.R. § 173.120.

<sup>51</sup> Gold, R., “Bakken Shale Oil Carries High Combustion Risk,” *Wall Street Journal*, February 23, 2014, *available at*: <http://www.wsj.com/news/articles/SB10001424052>.

<sup>52</sup> *See* 46 C.F.R. § 30.10-59, defining Reid vapor pressure as the vapor pressure of a liquid at a temperature of 100-degrees Fahrenheit, expressed in pounds per square inch absolute.

flammable gases, such as butane, propane and ethane, when temperatures rise. A higher Reid vapor pressure indicates a greater tendency for these flammable gases to evaporate. Attention centered on the vapor pressure of Bakken crude oil after the Transportation Safety Board of Canada concluded, in studying the disaster at Lac-Mégantic, that “the size of a fireball resulting from the ignition of spilled crude oil strongly depends on vapor pressure.”<sup>53</sup>

Though there is variability in the properties of Bakken crude oil, the vapor pressure of Bakken crude is known to be very high, and in fact, far higher than most other crude oils shipped from or within the United States and from around the world. PHMSA, in its July 2014 Operation Safe Delivery Update, concluded that “Bakken crude has a higher gas content, higher vapor pressure, lower flash point and boiling point and thus a higher degree of volatility than most other crudes in the U.S., which correlates to increased ignitability and flammability.”<sup>54</sup> PHMSA-measured Reid vapor pressure readings range from 7.7 to 11.75 psi in a dozen samples of Bakken crude oil initially analyzed, and from a Reid vapor pressure range of 10.1 to 15.1 psi in a second set of 88 samples.<sup>55</sup> In another study, the *Wall Street Journal* reported that, on average, Bakken crude oil has a “volatility rating far higher than other crude oil samples collected from 86 locations around the world.”<sup>56</sup> According to data collected by a pipeline company and analyzed by the *Journal*, compared to a Reid vapor pressure of 8.56 psi in Bakken crude oil (and readings as high as 9.7 psi in some samples), the next most volatile oil was Brent

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<sup>53</sup> Transportation Safety Board of Canada, Laboratory Report LP 148/2013, “Analysis of Crude Oil Samples” (Appendix K of Runaway and Main-Track Derailment, Montreal, Maine & Atlantic Railway Freight Train MMA-002), *available at*: <http://www.tsb.gc.ca>.

<sup>54</sup> “Operation Safe Delivery Update,” Pipeline and Hazardous Materials Safety Administration, *available at*: [http://www.phmsa.dot.gov/pv\\_obj\\_cache/pv\\_obj\\_id\\_8A422ABDC16B72E5F166FE34048CCCBFED3B0500/filena me/07\\_23\\_14\\_Operation\\_Safe\\_Delivery\\_Report\\_final\\_clean.pdf](http://www.phmsa.dot.gov/pv_obj_cache/pv_obj_id_8A422ABDC16B72E5F166FE34048CCCBFED3B0500/filena me/07_23_14_Operation_Safe_Delivery_Report_final_clean.pdf).

<sup>55</sup> *Id.*

<sup>56</sup> Gold, R., “Bakken Shale Oil Carries High Combustion Risk,” *Wall Street Journal*, February 23, 2014, *available at*: <http://www.wsj.com/articles/SB10001424052702304834704579401353579548592>.

crude from the North Sea (6.17 psi), followed by Basrah Light oil from Iraq (4.8 psi).<sup>57</sup> In the same report, Tesoro Corp., a major transporter of Bakken crude to the West Coast, acknowledged that it has regularly received oil from the Bakken Shale with vapor pressure measuring up to 12 psi.<sup>58</sup> Only crude oil from the Eagle Ford Shale in Texas displays a Reid vapor pressure similar to crude from the Bakken Shale.<sup>59</sup> Additionally, *The Oregonian*, in another analysis of Bakken crude oil samples, reported that six samples of Bakken crude oil had an average Reid vapor pressure reading of 10.62 psi, well above the vapor pressures of Brent crude oil (5.61 psi) and Light Louisiana Sweet (2.38 psi), two other types of crude oil that are commonly run in U.S. refineries. And, most recently, a sample of Bakken crude oil from the train derailment in Lynchburg, Virginia, was reported to have a vapor pressure of 18.5 psi.<sup>60</sup>

These conclusions concerning the high volatility of Bakken crude oil are in line with a study released by Dangerous Goods Transport Consulting Inc., a lobbying group for oil refiners.<sup>61</sup> The data consisted of 1,400 samples collected from 17 refineries in the United States that accept rail deliveries of Bakken crude oil. The samples averaged a Reid vapor pressure measurement of 8.0 psi in warmer weather and 12.5 psi in colder weather.<sup>62</sup> According to the data, many samples were at the high end of the range, with the highest at 15.54 psi.<sup>63</sup>

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<sup>57</sup> *Id.*

<sup>58</sup> *Id.*

<sup>59</sup> *Id.*

<sup>60</sup> Sobczak, B., “Crude in Va. oil-train derailment was highly volatile -- safety data,” *EnergyWire*, E&E Publishing, LLC, Aug. 25, 2015.

<sup>61</sup> See “A Survey of Bakken Crude Oil Characteristics Assembled for the U.S. Department of Transportation,” Dangerous Goods Transport Consulting, Inc., May 14, 2014.

<sup>62</sup> *Id.* at 20.

<sup>63</sup> *Id.* at 19. The Report concludes that, “[w]hile Bakken crude (and other light crudes) may contain higher amounts of dissolved flammable gases compared to some heavy crude oils,” the hazardous characteristics of Bakken crude oil do not justify the creation of a new Department of Transportation hazard class. The report states that, “the

A review of previously published literature by Sandia National Laboratories (“Sandia”) concludes that Bakken crude oil “exhibits a statistically higher true vapor pressure” than other forms of crude oil, due to its higher amounts of propane, butane and ethane.<sup>64</sup> While the Sandia review observed that various parameters can affect the flammability of fuel, it did not disagree that the vapor pressure of an oil affects and contributes to its flammability.<sup>65</sup> Although the authors recommended more study, no timetable for sampling and analysis of Bakken crude oil has been announced, and a recent statement by the U.S. Department of Energy’s Office of Fossil Energy acknowledges that no plans exist to fund further combustion testing or sampling and analysis that have been suggested by the authors.<sup>66</sup>

#### **D. The volatility of crude oil can be effectively reduced with existing technology**

No federal law regulates the vapor pressure of crude oil being transported by rail in the United States. Despite this, industry has for years employed technology to process crude oil to reduce or remove the combustible gases that give crude oil its high volatility.<sup>67</sup> The technology is well-known and easily accessible. In the Eagle Ford Shale formation in southwestern Texas, for example, where crude oil has a volatility and vapor pressure similar to crude oil from the Bakken Shale, shippers must treat crude oil through a process called “stabilization” to reduce its

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information provided confirms that Bakken crude oil does not pose risks significantly different than other crude oils or other flammable liquids authorized for rail transport.” *Id.* at 4.

<sup>64</sup> “Literature Survey of Crude Oil Properties Relevant to Handling and Fire Safety in Transport,” Sandia National Laboratories, March 2015, at 13-14, *available at*: <http://energy.sandia.gov/tight-oil-study>. The survey did not include any first-hand sampling or analysis. In addition to Sandia staff, private entities and employees of the University of North Dakota contributed to the survey. *Id.* at 3.

<sup>65</sup> *Id.* at 13-14.

<sup>66</sup> See “Crude Oil Characteristics Research,” Department of Energy, Office of Fossil Energy, July 9, 2015, *available at*: <http://energy.gov/fe/articles/crude-oil-characteristics-research>.

<sup>67</sup> See, e.g., Manning, F.S. and R.E. Thompson, “Oilfield Processing of Petroleum: Crude Oil,” Chapter 9, *Stabilization and Sweetening of Crude Oil*, PennWell Publishing Co. (1995), which describes a variety of methods for crude oil stabilization known in the 1970s and 1980s.

volatile characteristics.<sup>68</sup> Stabilization involves the use of distillation towers to heat crude oil at optimal temperatures and pressures, with the result of stripping out volatile propanes, butanes and ethanes and thereby reducing the volatility (and vapor pressure) of the oil itself.<sup>69</sup> Producers and shippers of Eagle Ford crude oil have no choice but to do so because pipeline companies who operate in the Eagle Ford Shale require the oil they ship to meet thresholds for vapor pressure.<sup>70</sup> Similarly, pipeline operators, along with federal and state regulatory authorities, require shippers to limit the vapor pressure of other highly flammable liquids. For example, the U.S. Environmental Protection Agency, various states, and pipeline operators across the country have adopted Reid vapor pressure limits for gasoline, which require shippers to employ similar stabilization technology.<sup>71</sup>

In contrast, shippers in North Dakota are not currently required to use stabilization treatment to reduce the volatility of Bakken crude oil prior to shipment, and largely do not do so. Instead, shippers employ a less rigorous (and cheaper) technique of boiling off the volatile components, called “conditioning.” Estimated to cost only about 10 cents a barrel,<sup>72</sup> conditioning is inexpensive and does not require the construction of significant infrastructure.<sup>73</sup>

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<sup>68</sup> See Hays, K., “Safety debate eyes taming Bakken crude before it hits rails,” *Reuters*, May 12, 2014.

<sup>69</sup> *Id.*

<sup>70</sup> See, e.g., Eagle Ford Pipeline LLC tariff document, Texas Rail Road Commission No. 1.7.0, at 12, March 1, 2015 (effective) (allowing pipeline operator to reject crude oil shipments having Reid vapor pressure in excess of 9.0 psi); Joint Local and Incentive Rate Tariff between Double Eagle Pipeline LLC and Kinder Morgan Crude & Condensate LLC, Texas Rail Road Commission No. 08, at 5, March 1, 2015 (effective) (Reid vapor pressure limit of 10.0 psi).

<sup>71</sup> See Guide on Federal and State Summer RVP Standards for Conventional Gasoline Only, U.S. Environmental Protection Agency, *available at*: <http://epa.gov/otaq/fuels/gasolinefuels/volatility/standards.htm>; see also Magellan Pipeline Product Specifications, Version 100, July 1, 2015.

<sup>72</sup> See Memorandum from North Dakota Dept. of Mineral Resources, Oil and Gas Division, *available at*: <https://www.dmr.nd.gov/oilgas/ConditioningFAQ040215.pdf>.

<sup>73</sup> See Gold, R. and C. Dawson, “North Dakota Fracking: Behind the Oil-Train Explosions,” *Wall Street Journal*, July 7, 2014.

A major limitation of crude oil conditioning, however, is that it leaves a majority of the volatile gases in solution, meaning that conditioned crude oil retains a significant level of its volatility.<sup>74</sup>

Without stringent requirements for the treatment of crude oil transported by rail, the uncontrollable fires and explosions seen in the train accidents to date are likely to continue.

## **REGULATORY HISTORY**

### **A. The PHMSA Final Rule for High-Hazard Flammable Trains**

Due in large measure to the heightened concerns raised by the many recent explosions of train cars transporting Bakken crude oil, PHMSA, in coordination with FRA, promulgated a final rule in May 2015, to regulate certain aspects of crude oil transportation by rail. The rule, titled “Hazardous Materials: Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains,” became effective in July 2015 (“Flammable Train Rule”).<sup>75</sup> According to PHMSA, the new rule was promulgated to “reduce the consequences, and, in some instances, reduce the probability of accidents involving trains transporting large quantities of flammable liquids.”<sup>76</sup> PHMSA issued the Flammable Train Rule with almost 3,500 comments from federal and state agencies, public interest groups, the oil and railroad industries, and the public.<sup>77</sup>

The focus of the Flammable Train Rule is to define certain trains transporting large volumes of flammable liquids as High-Hazard Flammable Trains (“HHFTs”), which include tank

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<sup>74</sup> *Id.*

<sup>75</sup> Hazardous Materials: Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains, 80 Fed. Reg. 26644 (effective date: July 7, 2015).

<sup>76</sup> *Id.* at 26644.

<sup>77</sup> See Proposed Rule Hazardous Materials: Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains, August 1, 2014, at <http://www.regulations.gov/#!documentDetail;D=PHMSA-2012-0082-0180>. 79 Fed. Reg. No. 148, 45016 (Aug. 1, 2014).

cars that transport crude oil, and to regulate their design and operation to some extent.<sup>78</sup> Among other things, the new rule imposes braking standards for HHFTs operating at speeds greater than 30 miles per hour, enhanced standards for risk assessment and information sharing with regard to rail routing, notification requirements to State Emergency Response Commissions, and a speed limit of 40 miles per hour for HHFT trains traveling in select High Traffic Urban Areas.<sup>79</sup>

The Flammable Train Rule also requires new tank cars constructed after October 1, 2015, to meet new DOT Specification 117 design or performance criteria.<sup>80</sup> The new standards include, among other things, a thicker minimum shell size (9/16-inch steel shell compared to 7/16-inch steel shell on current DOT-111 trains), thermal protection, a full-height head shield to replace optional head shields on DOT-111 cars, and an 11-gauge jacket to replace optional jackets on DOT-111 cars.<sup>81</sup> Under the new rule, existing DOT-111 and CPC-1232 tank cars may continue to carry crude oil in HHFTs, but are required to meet retrofitting standards that are in ways less stringent than PHMSA's standards for new tank cars.<sup>82</sup> For example, retrofitted DOT-111 and CPC-1232 tank cars do not require thicker shells that enhance protection against breaches and punctures, or top-fitting structures that protect valves in the event of a crash.<sup>83</sup> Retrofitting deadlines will require replacing DOT-111 and CPC-1232 tank cars for Packing Group I, which covers most crude shipped by rail, within three years for non-jacketed DOT-111 cars (January 1, 2018), and five years for non-jacketed CPC-1232 cars (April 1, 2020). The rule

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<sup>78</sup> 49 C.F.R. § 171.8.

<sup>79</sup> 49 C.F.R. § 174.310.

<sup>80</sup> 49 C.F.R. § 179.202.

<sup>81</sup> 49 C.F.R. § 179.202.

<sup>82</sup> *See* 49 C.F.R. § 179.202-13.

<sup>83</sup> *See* 49 C.F.R. § 179.202-13(c) and (h).

will allow continued operation of jacketed DOT-111 tank cars for three years (March 1, 2018), and jacketed CPC-1232 cars for approximately 10 years (May 1, 2025).<sup>84</sup>

Though the Flammable Train Rule sets in place new regulations pertaining to the design and operation of train cars, it does nothing to enhance regulations that concern the properties of the highly combustible liquids that these train cars transport. In its Notice of Proposed Rulemaking, PHMSA asked whether exceptions for certain flammable liquids would incentivize producers to reduce the volatility of crude oil.<sup>85</sup> In its comments to the Flammable Train Rule, PHMSA notes that “[t]he majority of commenters from all backgrounds provided general support for pre-treatment of crude oil prior to transportation.”<sup>86</sup> PHMSA, however, elected not to conduct rulemaking to require the pre-treatment of crude oil to reduce its volatility, and opted to “continue to conduct inspections or bring enforcement actions” and to better understand best practices for testing and classifying crude oil.<sup>87</sup>

As PHMSA notes in its Final Regulatory Impact Analysis to the Flammable Train Rule, however, prior to 1990, the packaging requirements for flammable liquids were based on characteristics that included vapor pressure.<sup>88</sup> Moreover, PHMSA does regulate crude oil shipments based in part on the temperatures at which the crude oil boils (boiling point) and ignites (flash point).<sup>89</sup> Since 1990, and as now prescribed under the Flammable Train Rule, however, no Federal standard regulates the vapor pressure of crude oil transported by rail.

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<sup>84</sup> 49 C.F.R. § 173.243.

<sup>85</sup> 79 Fed. Reg. No. 148, 45016, at 45062 (Aug. 1, 2014).

<sup>86</sup> 80 Fed. Reg. 26644, at 26665.

<sup>87</sup> *Id.* at 26665-666.

<sup>88</sup> PHMSA Regulatory Impact Analysis, at 31-32.

<sup>89</sup> *See* 49 C.F.R. § 173.120.

## **B. North Dakota Industrial Commission Conditioning Standards for Crude Oil**

In April 2015, the North Dakota Industrial Commission (“NDIC”) adopted new conditioning standards on rail transporters. Under the NDIC’s regulations, crude oil produced from production facilities located within North Dakota must have a Reid vapor pressure not greater than either 13.7 psi, or one percent less than the vapor pressure of stabilized crude oil, as defined in industry classification guidelines, whichever is lower.<sup>90</sup> The effectiveness of North Dakota’s 13.7 psi limit for preventing fires and explosions in train accidents, however, is questionable. In considering its new rules on crude tank cars, PHMSA commented that, “[i]t is our understanding that the level of pre-treatment described in [the NDIC] order will not have a drastic effect as most of the crude in North Dakota tests below 13.7 already.”<sup>91</sup> In the absence of any restrictions under federal law, North Dakota’s 13.7 psi standard is the only vapor pressure limit that exists for the transport of crude oil by rail.

### **PHMSA AUTHORITY FOR RULEMAKING AND STANDARDS FOR RULEMAKING PETITIONS**

The Secretary of Transportation has authority over interstate railroad transportation safety.<sup>92</sup> Federal hazardous materials transportation law authorizes the Secretary to “prescribe regulations for the safe transportation, including security, of hazardous material in intrastate, interstate, and foreign commerce.”<sup>93</sup> The Secretary has delegated this authority to PHMSA.<sup>94</sup>

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<sup>90</sup> See Order of the Industrial Commission of North Dakota, Case. No. 23084, Order No. 25417, at 3-4, December 9, 2014 (ordered), April 1, 2015 (effective), *available at*: <https://www.dmr.nd.gov/oilgas/Approved-or25417.pdf>.

<sup>91</sup> PHMSA Regulatory Impact Analysis, at 26.

<sup>92</sup> See Federal railroad safety laws, principally 49 U.S.C. chapters 201–213.

<sup>93</sup> 49 U.S.C. §§ 5101–5128; 49 U.S.C. § 5103(b).

<sup>94</sup> 49 C.F.R. § 1.97(b).

Rulemaking petitions to PHMSA are governed by 49 C.F.R. § 106, Subpart B, which, among other things, require a “summary of [petitioner’s] proposed action and an explanation of its purpose,” a statement of the “language [] propose[d] for a new or amended rule . . . ,” information about the “costs and benefits” to society and the effect on “the natural and social environments.”<sup>95</sup> This petition satisfies the requirements for rulemaking petitions to PHMSA as set forth in regulations promulgated by the U.S. Department of Transportation.

### **ARGUMENT**

#### **A. A new vapor pressure limit of less than 9.0 psi will improve the safety of crude oil transport by rail**

Although PHMSA, under its Flammable Train Rule, elected not to issue rulemaking on the vapor pressure of flammable liquids such as Bakken crude oil, sufficient evidence already exists to conclude that volatility should be tested and limited to a Reid vapor pressure limit of less than 9.0 psi on rail shipments of Bakken crude oil. This rulemaking is needed for several reasons.

First, sufficient evidence already exists to suggest that a high vapor pressure of crude oil can increase its tendency to ignite and explode. PHMSA has collected data that shows, at a

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<sup>95</sup> See 49 C.F.R. § 106.100: Required information for a petition for rulemaking. (a) You must include the following information in your petition for rulemaking: (1) A summary of your proposed action and an explanation of its purpose. (2) The language you propose for a new or amended rule, or the language you would delete from a current rule. (3) An explanation of your interest in your proposed action and the interest of anyone you may represent. (4) Information and arguments that support your proposed action, including relevant technical and scientific data available to you. (5) Any specific cases that support or demonstrate the need for your proposed action. (b) If the impact of your proposed action is substantial, and data or other information about that impact are available to you, we may ask that you provide information about the following: (1) The costs and benefits of your proposed action to society in general, and identifiable groups within society in particular. (2) The direct effects, including preemption effects under section 5125 of Federal hazardous materials transportation law, of your proposed action on States, on the relationship between the Federal government and the States, and on the distribution of power and responsibilities among the various levels of government. (See 49 CFR part 107, subpart C, regarding preemption.) (3) The regulatory burden of your proposed action on small businesses, small organizations, small governmental jurisdictions, and Indian tribes. (4) The recordkeeping and reporting burdens of your proposed action and whom they would affect. (5) The effect of your proposed action on the quality of the natural and social environments.

minimum, a strong likelihood that the particularly explosive tendencies of Bakken crude oil, as seen in recent events, is correlated to its high Reid vapor pressure. Crude oil from the Bakken Shale is known to contain highly volatile compounds, and studies have confirmed its higher vapor pressure compared to other forms of crude oil.<sup>96</sup> Importantly, PHMSA already requires testing of other physical and chemical properties of crude oil to ensure proper packaging and labeling, such as flash point and boiling point, but these rules do not impose substantive limits on volatility and plainly have not prevented the massive explosions and uncontrollable fires in the recent train accidents involving Bakken crude oil.

Sufficient data also exists to indicate that a Reid vapor pressure limit of less than 9.0 psi is likely to prevent large fires and explosions in future derailments of trains shipping crude oil. According to data available, Bakken crude oil involved in rail accidents measured a Reid vapor pressure of 9.0 psi or greater, which is consistent with sample data collected by PHMSA. More to the point, nearly every accident for which data is available involved Bakken crude oil with Reid vapor pressure readings at or below North Dakota's limit of 13.7 psi. This is illustrated below:

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<sup>96</sup> See Gold, R., "Bakken Crude Oil Carries High Combustion Risk," *Wall Street Journal*, Feb. 23, 2014.

Source	Vapor pressure of Bakken crude oil
Lac-Mégantic, Quebec (July 6, 2013)	Average between 9.0 to 9.5 psi <sup>97</sup>
Heimdal, North Dakota (May 6, 2015)	10.8 psi <sup>98</sup>
PHMSA Operation Safe Delivery	Average of 12.3 psi <sup>99</sup>
Mt. Carbon, West Virginia (February 16, 2015)	13.9 psi <sup>100</sup>
Lynchburg, Virginia (April 2015)	Average of 14.3 psi <sup>101</sup>

To be effective, any regulation of the vapor pressure of crude oil should be below the levels in the accidents listed above. Regulators in North Dakota themselves appear to agree: “Our oil conditioning order in no way will prevent an accident. Oil is still going to burn. That’s why the oil was produced. But it’s not as explosive.”<sup>102</sup> A rulemaking by PHMSA is needed to close this loophole, under which North Dakota’s 13.7 psi limit, a limit that has shown to be ineffective, has become the minimal nationwide standard for Bakken crude.<sup>103</sup>

<sup>97</sup> See Transportation Safety Board of Canada Laboratory Report LP148/2013, Aug. 19, 2014. The TSB Report notes that the vapor pressure measurements of these samples may be lower than the vapor pressure of the Bakken crude oil in the Lac-Mégantic accident: “The occurrence crude oil samples were taken at atmospheric pressure. This could lead to an underestimation of the crude oil[’]s volatility due to evaporation loss of very light constituents.”

<sup>98</sup> See Stern, M., “How to Prevent an Oil Train Disaster,” *N.Y. Times*, May 19, 2015.

<sup>99</sup> “Operation Safe Delivery Update,” Pipeline and Hazardous Materials Safety Administration, at 16, available at: [http://www.phmsa.dot.gov/pv\\_obj\\_cache/pv\\_obj\\_id\\_8A422ABDC16B72E5F166FE34048CCCBFED3B0500/filename/07\\_23\\_14\\_Operation\\_Safe\\_Delivery\\_Report\\_final\\_clean.pdf](http://www.phmsa.dot.gov/pv_obj_cache/pv_obj_id_8A422ABDC16B72E5F166FE34048CCCBFED3B0500/filename/07_23_14_Operation_Safe_Delivery_Report_final_clean.pdf).

<sup>100</sup> See Gold, R., “Crude on Derailed Train Contained High Level of Gas,” *Wall Street Journal*, March 2, 2015.

<sup>101</sup> See Sobczak, B., “Crude in Va. oil-train derailment was highly volatile -- safety data,” *EnergyWire*, E&E Publishing, LLC, Aug. 25, 2015.

<sup>102</sup> “Oil in North Dakota Derailment was treated to cut volatility,” Associated Press, May 7, 2015.

<sup>103</sup> Questions also exist as to North Dakota’s ability or willingness to enforce the 13.7 psi limit. For example, a sample of the Bakken crude oil involved in the accident at Lynchburg, Virginia, had a Reid vapor pressure of 18.5 psi. See Sobczak, B., “Crude in Va. oil-train derailment was highly volatile -- safety data,” *EnergyWire*, E&E Publishing, LLC, Aug. 25, 2015.

**B. A Reid vapor pressure of less than 9.0 psi for the transport of Bakken crude oil is readily attainable**

Second, the technology needed to stabilize Bakken crude to reduce its Reid vapor pressure below 9.0 psi is readily available in the United States and has long been used in the oil industry, although not in North Dakota.<sup>104</sup> For example, shippers operating in the Eagle Ford Shale formation in Texas regularly use stabilization to reduce the vapor pressure of oil from that region. Though not required to do so by law, shippers of Eagle Ford crude oil must meet Reid vapor pressure limits ranging from 9.0 to 10.0 psi – far below that of non-stabilized Eagle Ford crude oil – under tariff agreements with pipeline operators.<sup>105</sup> Similarly, the New York Mercantile Exchange, a futures exchange for commodities such as crude oil, requires a Reid vapor pressure limit of 9.5 psi in the contract specifications of its futures contracts for crude oil.<sup>106</sup> And finally, shippers must use similar methods to comply both with federal and state laws, and with contract specifications with pipeline operators, that apply to other types of flammable liquids. For example, shippers must meet a summer Reid vapor pressure limit of 9.0

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<sup>104</sup> See Interview of Russell Gold, <http://www.npr.org/2015/03/04/390757715/west-virginia-derailment-raises-concerns-about-volatility-of-bakken-oil>: “Well, it’s not very expensive at all – it’s cents on the barrel. And it’s really not very difficult to do this. And if you look at a place like Texas, quite regularly they’ll use a combination of heat and pressure to separate out the gases at the well site. But in North Dakota, that does not happen as much. There’s no infrastructure to do anything with the gas, so the oil producers prefer to keep the gas in the oil and just ship it to markets.”

<sup>105</sup> See, e.g., Eagle Ford Pipeline LLC tariff document, Texas Rail Road Commission No. 1.7.0, at 12, March 1, 2015 (effective) (allowing pipeline operator to reject crude oil shipments having Reid vapor pressure in excess of 9.0 psi); Enterprise Crude Pipeline LLC Local Proportional Tariff, Texas Rail Road Commission No. 174.7.0, at 13, Sept. 1, 2015 (effective) (right to reject crude oil having Reid vapor pressure in excess of 9.0 psi); Plains Pipeline, L.P., Rules and Regulations, Texas Rail Road Commission No. 70.9.0, at 8, Oct. 1, 2015 (effective) (Reid vapor pressure limit of 9.0 psi); and Joint Local and Incentive Rate Tariff between Double Eagle Pipeline LLC and Kinder Morgan Crude & Condensate LLC, Texas Rail Road Commission No. 08, at 5, March 1, 2015 (effective) (Reid vapor pressure limit of 10.0 psi).

<sup>106</sup> See CME Group, NYMEX Rulebook, Chapter 200 – Light Sweet Crude Oil Futures. CME references Reid vapor pressure of less than 9.5 psi at 100 degrees Fahrenheit.

psi for gasoline.<sup>107</sup> The technology to reduce the volatility of Bakken crude oil, and to significantly improve its safety for shipping by rail, is readily available, effective, and should be required for crude oil being shipped from the Bakken Shale across the United States.

**C. Without rulemaking on vapor pressure, current Federal standards will not prevent high intensity fires and explosions in future train accidents**

The Flammable Train Rule addresses issues that may be expected to reduce rail derailments, and to a certain extent, breaches of train cars that cause the crude oil being transported to ignite. But the rules do not go far enough. The rule does nothing to address or mitigate the characteristics of Bakken crude oil that cause it to explode in massive fireballs, as seen in the recent accidents, threatening nearby towns and communities. Considering that the new rule allows existing DOT-111 tank cars to continue operating for three years, and CPC-1232 tank cars for 10 years, interim measures to mitigate the severity of train accidents involving Bakken crude oil are vital.

The final rule imposes certain new standards that can be expected to lessen the likelihood of train derailments. Limits on train speed and requirements for enhanced braking mechanisms are important measures in this regard. Yet freight train derailments are certain to continue. Trains in some of the recent high-profile accidents were traveling at speeds well below 50 mph, the authorized speed for travel under the Flammable Train Rule, and below the 40 mph speed limits for High Traffic Urban Areas, as defined under the new rule.<sup>108</sup> Trains that derailed in accidents in Lynchburg, Virginia, and Galena, Illinois, were reportedly traveling below 25

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<sup>107</sup> See Guide on Federal and State Summer RVP Standards for Conventional Gasoline Only, U.S. Environmental Protection Agency, *available at*: <http://epa.gov/otaq/fuels/gasolinefuels/volatility/standards.htm>; *see also* Magellan Pipeline Product Specifications, Version 100, July 1, 2015.

<sup>108</sup> See 49 C.F.R. § 174.310(a)(2).

mph.<sup>109</sup> Trains involved in the derailments in Aliceville, Alabama, and Mt. Carbon, West Virginia, were traveling below 40 mph.<sup>110</sup> Reducing train speeds will not prevent the types of accidents that have occurred, and as the Department of Transportation, acknowledges, “[will] not end all derailments.”<sup>111</sup> PHMSA, in its Final Regulatory Impact Analysis to the Flammable Train Rule, predicts between 11.90 and 15.13 derailments of train cars transporting crude oil and ethanol, each year from 2015 to 2034.<sup>112</sup> Based on its calculations, the number of train derailments is expected to rise in each year from 2015 to 2024 before leveling at approximately 13 train derailments each year.<sup>113</sup>

The Flammable Train Rule issues new standards to enhance the strength of tank cars to lessen the probability of punctures and full breaches in the event of a derailment. PHMSA’s new design or performance standard, DOT-117, however, only applies to new tank cars built after October 1, 2015,<sup>114</sup> and allows existing DOT-111 and CPC-1232 tank cars to continue to transport crude oil for between three and 10 more years before these tank cars must be phased out or retrofitted.<sup>115</sup> The retrofit standards may not prevent future punctures, fires and explosions, as demonstrated by the recent train accidents in Lynchburg, Virginia, Mt. Carbon,

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<sup>109</sup> See Federal Railroad Administration, FRA Emergency Order No. 30, Notice No. 1, at 5-6, Apr. 24, 2015 (effective).

<sup>110</sup> *Id.*

<sup>111</sup> Sobczak, Blake, “Combined risk of crude and nuclear alarms Minn. tribe,” *EnergyWire*, E&E Publishing, Inc., Aug. 17, 2015, available at: <http://www.eenews.net/energywire/stories/1060023515>.

<sup>112</sup> PHMSA Regulatory Impact Analysis, at 82-83.

<sup>113</sup> *Id.*

<sup>114</sup> See 49 C.F.R. §§ 171.7, 173.241-243, 179.

<sup>115</sup> See 49 C.F.R. § 173.243. Under the Flammable Train Rule, all DOT-111 trains must be phased out or retrofitted by January 1, 2018 (non-jacketed) or March 1, 2018 (jacketed), and all CPC-1232 compliant trains must be phased out or retrofitted by April 1, 2020 (non-jacketed) or May 1, 2025 (jacketed).

West Virginia, and Galena, Illinois, which all involved train cars built to the newer CPC-1232 specifications.

Though many of the requirements for HHFTs under the new rule are important, and needed, the rule itself does not regulate the vapor pressure of crude oil. Vapor pressure is a primary concern when taking measures to mitigate the degree and intensity of fires and explosions that result from accidents like those over the past several years. Derailments, collisions and other accidents will continue despite the recent rulemaking, and fires, fireballs, and explosions are likely to continue until the crude oil being transported is itself processed to reduce its volatility. The proposed rulemaking would function as part of a suite of solutions to reduce the risk associated with crude oil transportation by rail, and work in conjunction with PHMSA's recently issued standards.

**D. To date, industry has not taken voluntary measures to effectively reduce the volatility of Bakken crude oil shipped in interstate commerce**

As explained in PHMSA's Final Regulatory Impact Analysis for the Flammable Train Rule, certain market failures may reduce or eliminate the appropriate full incentive of crude oil shippers and railroads to reduce the vapor pressure of Bakken crude oil voluntarily.<sup>116</sup>

As PHMSA notes, crude oil shippers, which include oil producers, refineries, and midstream companies such as Global Energy Partners and Buckeye Partners in New York, do not generally bear any liability for incidents after a rail carrier has accepted shipment.<sup>117</sup> And,

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<sup>116</sup> PHMSA Regulatory Impact Analysis, at 22-24.

<sup>117</sup> *Id.* at 24.

although shippers own or lease the tank cars that transport hazardous commodities such as crude oil, they have little incentive to ensure that the commodity they ship is safe for rail transport.<sup>118</sup>

On the other hand, rail carriers, such as CSX Transportation Inc., and Canadian Pacific Railway Limited, which own the railroads but not the trains that travel on them, state that they cannot refuse shipment because of their obligations under law as common carriers, although they largely bear the liability for freight rail accidents. In the tragedy at Lac-Mégantic, Quebec, for example, the rail carrier that transported Bakken crude oil into the town of Lac-Mégantic, Montreal, Maine & Atlantic Railways (“MM&A”), was sued for damages stemming from the accident.<sup>119</sup> MM&A, however, was not sufficiently insured or capitalized to cover the economic losses of the disaster, which may approach \$3 billion, and declared bankruptcy.<sup>120</sup> Gaps such as the case of MM&A illustrate how externalities emerge in which full compensation for severe injury or death may not be possible, and where the actual monetary value of damage to the environment is difficult to determine.<sup>121</sup> As PHMSA explains in its Final Regulatory Impact Analysis, it is unclear whether shippers and rail companies adequately insure against the consequences of accidents involving hazardous materials, and more so, whether adequate insurance is even available.<sup>122</sup> Although some insurance vendors have recently expanded the

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<sup>118</sup> See National Public Radio (NPR) report, *available at*: <http://www.npr.org/2015/02/25/389008046/a-hard-look-at-the-risks-of-transporting-oil-on-rail-tanker-cars>.

<sup>119</sup> See McLaughlin, D., *et al.*, “Montreal Maine Railway Files for Bankruptcy Protection After Crash,” *Bloomberg Business*, August 8, 2013, *available at*: <http://www.bloomberg.com/news/articles/2013-08-07/montreal-maine-railway-files-for-bankruptcy-after-crash>.

<sup>120</sup> See Villeneuve, M., “After ‘end of the world’ explosion, Lac-Mégantic aims to rebuild,” *Portland Press Herald*, April 17, 2014, *available at*: <http://www.pressherald.com/2014/04/17/after-end-of-the-world-explosion-lac-megantic-aims-to-rebuild>.

<sup>121</sup> PHMSA Regulatory Impact Analysis, at 22-23.

<sup>122</sup> *Id.* at 22.

excess casualty liability limits for high-traffic railroads to \$1 billion per accident,<sup>123</sup> this may nevertheless be inadequate to cover future accidents that involve large numbers of casualties, the destruction of property, and harm to the environment.

In its Final Regulatory Impact Analysis, PHMSA showed that these costs can be expected to be significant. PHMSA estimates that, in the absence of its recent rulemaking, damages stemming from a “Lower Consequence Event,” such as those that occurred in Lynchburg, Virginia, and Casselton, North Dakota, will total roughly \$180 to \$220 million per year, each year, from 2015 to 2034, or a total of approximately \$4.1 billion in damages.<sup>124</sup> PHMSA also conducted damages analysis for so-called “Higher Consequence Events,” which it characterizes by large-scale property damage and multiple fatalities. According to PHMSA’s analysis, the only Higher Consequence Event to date occurred at Lac-Mégantic, Quebec, in which 1.5 million gallons of crude oil were released and spread more than 100 kilometers down the Chaudiere River, and which resulted in the deaths of 47 people.<sup>125</sup> Estimates for the total cost to clean up, remediate, and rebuild the town of Lac-Mégantic have risen to almost \$2.7 billion. Modeling a variety of factors, including the possibility of a train accident in a high threat urban area, the loss of life, the damage to property, and the probability of damage to wetlands, PHMSA calculates that damages from Higher Consequence Events could reach \$12.6 billion over a 20-year period without its new rule.<sup>126</sup>

It may be that rail carriers are not adequately capitalized or insured to cover the type of Higher Consequence Events that PHMSA has modeled in its Final Regulatory Impact Analysis, in which case, the full measure of loss in such an event could not be recovered. The United

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<sup>123</sup> See Press Release, “AIG Provides Expanded \$1 Billion Casualty Capacity for North American Rail Companies,” Oct. 9, 2014, *available at*: <http://phx.corporate-ir.net/phoenix.zhtml?c=76115&p=irol-newsArticle&ID=1975783>.

<sup>124</sup> PHMSA Regulatory Impact Analysis, at 94.

<sup>125</sup> *Id.* at 95.

<sup>126</sup> *Id.* at 111-12.

States has no federal or state minimum insurance requirements for railroads carrying crude oil or other kinds of hazardous cargo,<sup>127</sup> and rail carriers often do not report their insurance coverage limits in securities filings.<sup>128</sup> This results in a system where no party is fully incentivized to take on voluntary measures to improve train safety, particularly when the number of train accidents involving train cars shipping volatile crude oil pales in comparison to the overall volume of crude oil being transported by rail. In such a system, rulemaking by PHMSA is essential.

### **PROPOSED RULEMAKING**

To ensure the safety of rail shipments of Class 3 flammable liquids, including Bakken Shale crude oil, the Office of the New York State Attorney General proposes the following rulemaking by PHMSA:

49 C.F.R. § 174.310(a)(6) *Vapor pressure of crude oil transported by rail tank cars.* Effective February 29, 2016, all crude oil transported by rail in interstate commerce within the United States shall not exceed a Reid vapor pressure as established herein at limit less than 9.0 pounds per square inch (“psi”).

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<sup>127</sup> Nearing, Brian, “Who pays if a crude oil train crashes? No mandates for rail insurance,” *Albany Times-Union*, May 2, 2015, *available at*: <http://www.timesunion.com/tuplus-business/article/Who-pays-if-a-crude-oil-train-crashes-No-6238612.php>.

<sup>128</sup> For example, CSX Transportation Inc. reports in its 2014 Annual Report that it has a \$25 million retention per occurrence for the non-catastrophic property program (such as derailment) and a \$50 million retention per occurrence for the liability and catastrophic property programs (such as hurricanes and floods). CSX Transportation Inc., however, does not report its coverage limits under these two programs. Form 10-K Annual Report for fiscal year ended December 26, 2014, CSX Transportation Inc., at 78, *available at*: <http://www.sec.gov/Archives/edgar/data/277948/000027794815000010/0000277948-15-000010-index.htm>.

## CONCLUSION

For the foregoing reasons, the Office of the New York State Attorney General respectfully requests that PHMSA initiate a rulemaking to adopt a maximum Reid vapor pressure standard that is less than 9.0 psi for the transportation of crude oil by rail in interstate commerce within the United States.

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Albany, New York

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