

**BEFORE THE STATE OF NORTH DAKOTA
PUBLIC SERVICE COMMISSION**

**IN THE MATTER OF DAKOTA ACCESS, LLC CONSOLIDATED APPLICATION
FOR AN AMENDED CERTIFICATE OF CORRIDOR COMPATIBILITY
AND AMENDED ROUTE PERMIT; DAKOTA ACCESS PIPELINE PUMP STATION -
EMMONS COUNTY SITING APPLICATION**

CASE. NO. PU-19-204 | OAH FILE. NO. 20190280

**PRE-FILED TESTIMONY OF DONALD HOLMSTROM
ON BEHALF OF INTERVENOR STANDING ROCK SIOUX TRIBE**

November 1, 2019

1 **I. INTRODUCTION AND QUALIFICATIONS**

2 **Q. Please state your name, business address, and position.**

3 A. My name is Donald Holmstrom. I am an attorney, investigator, and process safety
4 practitioner with many decades of experience with the oil industry and U.S.
5 government. I currently serve as a consultant to the Standing Rock Sioux Tribe
6 (the "Tribe") and as a member of the technical team advising the Tribe on technical
7 matters relating to the risks imposed by the Dakota Access Pipeline ("DAPL"). My
8 business address is 6200 Gale Drive, Boulder, CO 80303.

9

10 **Q. Please summarize your work experience and qualifications.**

11 A. For nearly a decade, I directed the Western Regional Office of the U.S. Chemical
12 Safety and Hazard Investigation Board, a nonregulatory scientific agency modeled
13 after the National Transportation Safety Board. As director, I managed and/or led
14 many of the largest and most significant chemical incident investigations in recent
15 U.S. history, including the 2005 BP Texas City explosion, the 2010 Tesoro
16 Anacortes oil refinery fire, the 2010 Deepwater Horizon offshore fire and explosion,
17 and the 2012 Chevron Richmond, CA oil refinery fire. During my tenure,
18 approximately two thirds of the Board's investigative staff worked for the Western
19 Regional Office under my direction.

20

21 Prior to that time, I worked in the oil industry, conducting incident investigations,
22 and implementing process safety protective measures for nearly two decades,
23 including investigating pipeline incidents. I have technical certifications and/or

24 technical training related to fire and explosion investigation, hazardous materials,
25 mechanical integrity, root cause determination, chemical testing, and emergency
26 response. I have authored or co-authored numerous articles on incident
27 investigation and process safety in publications such as Chemical Engineering
28 Progress, Loss Prevention Bulletin, Process Safety Progress, and the NFPA
29 Journal. More details on my experience and expertise is included in my c.v. which
30 is attached to this document.

31

32 **Q. On whose behalf are you testifying in this proceeding?**

33 A. I am testifying on behalf of the Standing Rock Sioux Tribe. The Tribe has
34 retained me to assist them in this matter and I am being compensated for my
35 time at a rate of \$100 per hour.

36

37 **Q. What is the purpose of your testimony?**

38 A. Dakota Access, LLC ("Applicant") has filed an Application for an Amended
39 Certificate of Corridor Compatibility and Amended Route Permit in which
40 Applicant proposes to nearly double the potential throughput of DAPL from
41 570,000 to 1,100,000 barrels per day (the "DAPL Capacity Expansion").¹ I was
42 asked to assess the potential consequences of the DAPL Capacity Expansion in
43 light of Applicant's existing oil spill response planning efforts, risk management

¹ While Applicant's application states that the current capacity of the pipeline is 600,000 bpd, other records indicate a capacity of 570,000 bpd. See, e.g., In the matter of the application of Dakota Access, LLC for an amendment to certificate and permit in accordance with the Dakota Access Pipeline Optimization in Emmons County, North Dakota, Case No. PU-14-842, "Application of Dakota Access, LLC for Waiver or Reduction of Procedures and Time Schedules," p. 3.

44 approach for High Consequence Areas (HCAs) and the safety record of
45 Applicant and its corporate parents. I was asked to analyze whether and how the
46 DAPL Capacity Expansion may worsen the consequences of a potential
47 discharge from DAPL and its potential adverse effects on the environment and
48 on the welfare of the citizens of North Dakota. In particular, I was asked to
49 analyze whether the DAPL Capacity Expansion increases the risks associated
50 with a discharge into Lake Oahe and the resulting impacts to human, animal, and
51 Tribal welfare, rights, and interests.

52

53 **Q. Did you prepare or direct the preparation of this testimony?**

54 A. Yes.

55

56 **II. SUMMARY OF TESTIMONY**

57 **Q. Please summarize your testimony.**

58 A. The DAPL Capacity Expansion poses significant risks in light of Applicant's
59 existing oil spill response planning efforts, risk management approach and the
60 safety record of Applicant and its corporate parents. I have two primary concerns.
61 First, over the last 13 years, Applicant's corporate parent Energy Transfer ("ET")
62 has the worst hazardous liquid safety record in the industry. Its poor safety
63 record indicates that oil spills from DAPL are a significant risk.

64

65 Second, by doubling the amount of oil that is transported through the pipeline,
66 the DAPL Capacity Expansion will greatly increase the Worst Case Discharge

67 (WCD) volume amount if and when such spills occur. Applicant's oil spill planning
68 efforts to date do not meet industry or regulatory standards and are untethered
69 from reality. Applicant relies on a WCD analysis that significantly underestimates
70 the true worst-case scenario, and Applicant has failed to develop a valid spill
71 model based upon an accurate WCD that can tell Applicant (or anyone else)
72 what will happen to the oil once it is spilled.

73

74 Finally, Applicant's pipeline risk management approach is seriously dated and
75 ineffective. It does not incorporate the latest approaches from pipeline industry
76 best practices that have been developed specifically to address concerns related
77 to the number and magnitude of pipeline releases over the last few years. In fact,
78 modern pipeline safety standards would have Applicant rigorously examine the
79 safety implications of a change such as doubling the throughput for a crude oil
80 pipeline utilizing a Management of Change safety system approach. The same
81 standards would base risk management focus on an operator's own safety
82 record to drive continuous improvement rather than declaring low risk by pointing
83 to generic industry statistics as Applicant has done. But examining the current
84 record, we know these more rigorous industry approaches have not been
85 employed.

86

87 By doubling the amount of oil transported through the pipeline, the DAPL
88 Capacity Expansion will significantly increase the risk associated with any spill

89 and compound the deficiencies in Applicant's existing spill prevention and oil-spill
90 response planning efforts.

91

92 **Q. What specific areas are you concerned about?**

93 A. I am concerned that Applicant has failed to develop an oil-spill response plan that
94 adequately reflects and mitigates the risks associated with operating DAPL at
95 double the throughput. Applicant's existing oil-spill response efforts seriously
96 underestimate oil spill impacts, and Applicant has failed to develop a valid WCD
97 sufficient to permit sound oil-spill response planning efforts. In particular,
98 Applicant has failed to develop a valid WCD for a discharge in Lake Oahe that is
99 sufficient to permit sound oil-spill response planning efforts and to minimize
100 DAPL's adverse effects on that critical resource.

101

102 A valid WCD is the starting point for the development of an oil spill response
103 plan. One needs to be prepared for the biggest spill that is realistic at a given
104 site. Without that estimate, any response plan is an empty exercise. How many
105 booms are needed? How many people will need to respond and in what time
106 frame? What kind of equipment needs to be staged and available? The answer
107 to all of these questions depends to a large degree on the WCD.

108

109 The development of a WCD is a simple and straightforward process that is done
110 all the time for pipelines and similar facilities. In fact, it is governed by regulation,
111 at 40 C.F.R. § 194.105 and follows a formulaic calculation: worst-case detection

112 time plus time to shut down the pipeline, multiplied by the maximum flow rate,
113 plus “drain down” volumes (i.e. how much oil would be in the pipeline segment
114 between valves that can still be released once valves are shut off). Applicant,
115 however, has failed to perform this critical but simple exercise.

116

117 **Q. What are your specific concerns related to Applicant’s existing WCD?**

118 A. First, the WCD analysis appears to underestimate both the risk as well as the
119 amount of a potential spill. It is worse than a “best case” scenario in that it leaves
120 required calculations out and then assumes all systems will function precisely as
121 intended—i.e., the incident is discovered as quickly as physically possible, the
122 correct decision and response is immediately initiated, and all equipment such as
123 controls, sensors, pumps and valves function as intended. In the real world,
124 however, this is not how major events happen. Major spill incidents typically
125 occur with multiple system causes, when people, or equipment, or systems do
126 not function exactly as they are expected to. People make mistakes. Equipment
127 malfunctions. Systems are deficient. Modern major accident prevention focuses
128 on rigorous analysis of all potential hazards (what could go wrong) and
129 implements continuous improvement to a variety of complex, interrelated safety
130 systems such as operational controls, human factors, integrity management,
131 incident investigation, safety culture, risk management, and safety assurance.
132 Effective risk analysis must consider all these important elements to achieve
133 incident prevention.

134

135 Applicant's WCD ignores these realities. Applicant assumes that any spill will be
136 detected immediately and shut down in a mere 9 minutes. Applicant omits
137 entirely the time it takes detect the spill or the time it takes to shut the emergency
138 isolation vales (referred to as Emergency Flow Restriction Devices (EFRDs)).

139
140 The assumptions baked into Applicant's WCD are not realistic and do not comply
141 with the minimum regulatory requirements. Detection time is a critical factor in
142 worst case discharge. In some cases, it takes hours or even days to detect the
143 leak before shutdown is initiated. For example, in the 2016 Permian Express II
144 pipeline crude oil spill of 361,000 gallons, it took ET 12 days to detect the spill
145 and shut down the pipeline. The spill from the central Texas pipeline, which had
146 only been operational for one year, led to a reported \$4 million in property
147 damage. Yet, in the case of DAPL, Applicant lacking any evidence such as
148 performance metrics assumes that it will instantaneously detect any spill.

149
150 Applicant is now proposing to double DAPL's capacity – and to double the
151 amount of oil that will be discharged if and when a spill occurs – despite the
152 unrealistic WCD on which its oil-spill response planning efforts are based.
153 Allowing Applicant to double DAPL's throughput despite Applicant's failure to
154 provide any proof of performance would impose serious risks on the environment
155 and on the welfare of the citizens of North Dakota.

156

157 **Q. Besides Applicant's failure to include detection time in its WCD, do you**
158 **have other concerns regarding Applicant's WCD?**

159 A. Yes. In addition to Applicant's unrealistic assumption that it will instantaneously
160 detect any spills, Applicant's WCD underestimates the true worst-case scenario
161 for other reasons:

- 162 • The PHMSA WCD regulation requires the worst case analysis to be
163 applied to each element of the calculation. Applicant's "best case"
164 approach is not compliant with this explicit instruction.
- 165 • The WCD does not appear to include any consideration of "historic"
166 discharges and there are many examples from ET's numerous other spills
167 and leaks.
- 168 • Applicant's calculation does not include the time it takes to shut down the
169 EFRDs after the pumps are ramped down but while oil is still flowing past
170 the valves and out the point of pipeline failure.
- 171 • The WCD does not account for potential delays and complications due to
172 adverse weather conditions. This includes the lack of backup power to
173 close the Lake Oahe EFRDs in the advent of a power failure. DAPL has
174 backup power to the communication system but not electrical power to the
175 valve actuator. DAPL's EFRDs are capable of manual closure, however,
176 travel to the remote, unstaffed location of the EFRDs particularly in winter
177 conditions should be measured in hours and included in the WCD.
- 178 • The WCD does not incorporate other factors called for by industry best-
179 practices, such as including the time to interpret or verify data, check for

180 false alarms, or the human factors of decision-making under the stress of
181 a possible emergency shutdown. Pipeline Industry safety standards
182 require evaluation and decision-making by a pipeline controller where leak
183 detection systems such as a Computational Pipeline Monitoring (CPM)
184 systems are in an alarm state indicating a possible commodity release.
185 DAPL's leak detection system does not automatically shut down the
186 pipeline – this requires human decision-making and action. API RP 1130
187 Computational Pipeline Monitoring for Liquids (2007) for example, requires
188 such an evaluation. RP 1130 (2007) has been incorporated into DOT
189 regulations by reference. This factor must be included in WCD shutdown
190 time. However, DAPL's WCD calculation includes no time for detection
191 generally and none for issues related to spill identification and shutdown
192 decision-making.

- 193 • Software-based leak detection systems are notoriously unreliable. A 2012
194 PHMSA study examined the agency's spill database and found that CPM
195 systems detected hazardous liquid leaks in the pipeline rights-of-way
196 (ROW) only 20% of the time. Similar leak detection performance can be
197 seen by a review of Energy Transfer's pipelines in the PHMSA database
198 from 2010-18. Like the PHMSA study, more Energy Transfer spills in the
199 right-of-way (ROW) were identified by random members of the public than
200 SCADA or CPM systems. To address this serious industry performance
201 issue, API issued Recommended Practice 1175, Pipeline Leak Detection
202 Program Management (2015) requiring in its RP that pipeline operators

203 evaluate their own performance by establishing leak detection metrics for
204 continuous improvement. There is no record that Applicant has identified
205 its leak detection record as a problem or evaluated its past data and
206 established metrics to improve performance under this important standard.

207

208 The North Dakota Public Service Commission (NDPSC) should review the 2016
209 DAPL source documents that relate to its spill model calculation and compare
210 this for themselves to the PHMSA formula. NDPSC should request and examine
211 metrics related to DAPL pipeline emergency shutdown response time including
212 leak detection – both CPM system and human performance. The NDPSC should
213 also request any performance testing of the DAPL CPM leak detection system as
214 provided in API RP 1130, including actual and simulated crude oil removal.

215

216 **Q. What is a spill model?**

217 A. A spill model is an analytical tool that tells you what will happen to the oil and its
218 impacts once it is spilled. A valid spill model is essential to assessing the risks
219 associated with pipeline discharge.

220

221 **Q. Has Applicant developed a valid spill model?**

222 A. No. To the best of my knowledge all DAPL spill models were based on the
223 assumption of a WCD that has been significantly underestimated. The technical
224 spill model is only as valid as the assumption of the WCD. In the case of the
225 latest 2018 spill model it stated that the model incorporated the deficient WCD

226 produced by Applicant. The fact that Applicant grossly understates the WCD in
227 the information supplied to the spill model developer invalidates the model as to
228 emergency response planning and spill impacts.

229

230 **Q. Why is Applicant's failure to develop a valid spill model concerning?**

231 A. Applicant's failure to develop an accurate spill model means that critical
232 information is missing from oil-spill response planning efforts. These serious
233 deficiencies include important information concerning the magnitude of hazards
234 faced by emergency responders, the geography of areas impacted by a spill, and
235 number and type of equipment needed by emergency responders. Applicant's
236 failure to develop a valid spill model and response plan concerning Lake Oahe –
237 a High Consequence Area (HCA) – is particularly concerning to me, especially
238 because Applicant's corporate parent, Energy Transfer, has the worst safety spill
239 record in the industry.

240

241 **Q. What are your general concerns regarding the safety record of Applicant's**
242 **corporate parent, Energy Transfer?**

243 A. In evaluating Applicant's oil-spill response planning efforts and their WCD
244 calculations in particular, it is important to take the incident history and safety
245 record of Applicant's corporate parent, Energy Transfer, into account. Since spills
246 are the result of company management system deficiencies including often
247 issues of leadership, governance and effective oversight over safety and
248 environmental protection, it is important to examine the record of the company as

249 a whole. The eight hazardous liquid pipelines entities in the PHMSA database
250 listed on the Energy Transfer website and that are wholly owned subsidiaries or
251 with an ET controlling interest include DAPL-ETCO Operations Management,
252 Energy Transfer Company, Sunoco Pipeline L.P., West Texas Gulf Pipeline Co.,
253 Mid-Valley Pipeline Co., Permian Express Partners LLC, Harbor Pipeline Co.,
254 and Inland Corporation.

255

256 The Energy Transfer hazardous liquid pipelines including DAPL have the poorest
257 pipeline spill record in the industry. Their poor safety record indicates that there is
258 a higher risk that a DAPL spill will occur, and that, when it happens, the
259 consequences will be severe. However, this elevated DAPL risk has not been
260 effectively evaluated by Energy Transfer nor is there any evidence the company
261 has taken appropriate corrective action for performance improvement.

262

263 **Q. What are your specific concerns regarding the safety record of Energy**
264 **Transfer?**

265 A. The history of Energy Transfer pipelines is replete with spill incidents – and not
266 just in the distant past. In recent months and years, Energy Transfer and its
267 pipelines have caused a number of high-profile release incidents that have
268 resulted in government enforcement actions, shutdowns and remedial actions.

269

270 As of December 3, 2018, the Dakota Access Pipeline itself had experienced 12
271 spills of over 6,100 gallons of Bakken crude oil in less than two years of

272 operation. In fact, from 2006 to 2018 across all ET hazardous liquid pipeline
273 entities in the PHMSA database that are wholly owned subsidiaries of ET or in
274 which ET has a controlling interest, hazardous liquid incidents numbered 458
275 with \$109,737,246 in property damage from 2,557,716 gallons (60,898 bbls) of
276 hazardous liquid spilled. For the 13-year period, ET entities experienced 45%
277 more hazardous liquid spills than the pipeline company with the next largest
278 number of incidents. Just in the 2017-2018 operating period of DAPL, Energy
279 Transfer company-wide hazardous liquid spills have resulted in \$20,540,487 in
280 property damage, indicating significant harm from the company's most recent
281 hazardous liquid pipeline operations. For the 13-year period, ET experienced
282 three spills a month - by far the highest spill incident rate in the industry for that
283 period.

284

285 In recent years, Energy Transfer's poor safety record has prompted
286 unprecedented regulatory enforcement actions. In 2017-2018, Sunoco was
287 forced to suspend pipeline operations because of environmental contamination
288 on four separate occasions across three states.

289

290 In Pennsylvania, the Department of Environmental Protection (DEP) Secretary
291 noted "a permit suspension is one of the most significant penalties DEP can
292 levy," HDD drilling operations were reported shutdown by FERC on the Rover
293 Pipeline in Ohio related to the release of nearly 150,000 gallons of drilling fluid. A
294 spill of 2,000,000 gallons of drilling fluid reportedly occurred at the same site in

295 April 2017. The Mariner 2 East pipeline was shutdown January 3, 2018 by the
296 Pennsylvania DEP for leaks and spills that were described as "egregious and
297 willful violations" of law. And West Virginia's DEP reportedly ordered the halt to
298 Sunoco's Rover Pipeline Construction in July 2017 due to environmental
299 violations.

300

301 Before being allowed to double the throughput of DAPL, Applicant should adduce
302 some evidence demonstrating that it is taking appropriate corrective actions to
303 improve on ET's poor safety record. Yet applicant has failed to do so. Applicant's
304 spill model, response plan, and general approach to risk management along
305 DAPL, and particularly the DAPL crossing at Lake Oahe, fail to meet regulatory
306 and industry standards. It is concerning that Applicant would seek to double
307 DAPL's capacity despite these failings.

308

309 **Q. Why are Applicant's spill model and response plan for Lake Oahe**
310 **concerning?**

311 A. In addition to dramatically underestimating the WCD, the latest DAPL spill model
312 indicates that a Bakken crude oil spill will only remain on the surface of Lake
313 Oahe for a few hours and then be primarily immersed in the water column. The
314 remediation of crude oil spills immersed in the water column is very difficult. The
315 DAPL Geographic Response Plan (GRP) for Lake Oahe, however, focuses on a
316 cleanup that assumes the oil will persist on the lake's surface. In other words,
317 Applicant has developed a spill model that underestimates the magnitude of a

318 WCD into Lake Oahe and acknowledges that a spill would only remain on the
319 surface of Lake Oahe for a few hours before becoming immersed in the water
320 column, yet Applicant has developed a response plan for Lake Oahe that focuses
321 on surface – not water column – cleanup efforts. Applicant's Lake Oahe
322 response plan is fundamentally at odds with its spill model, deficient as it is.
323 Doubling DAPL's throughput would compound the gravity of these safety
324 deficiencies.

325

326 Regulators, first-responders, impacted parties such as the Tribe, and Applicant
327 itself need to see a spill model that reflects realistic risks and can guide effective
328 response efforts based upon an accurate WCD and what would be the increased
329 spill impacts from a doubling of DAPL flow. Without a valid spill model that
330 answers the following questions, it is impossible to plan effective response
331 efforts. Applicant should also provide the corresponding documentation to the
332 NDPSC.

- 333
- 334 • Has Applicant updated their WCD calculation compliant with PHMSA and
335 industry standards for the proposed doubling of the DAPL flow?
 - 336 • Has Applicant revised the spill model to include the updated compliant and
337 more accurate WCD?
 - 338 • Has Applicant updated their Geographic Response Plan to be consistent
339 with the 2018 spill model conclusions and revised WCD for the doubling of
the DAPL flow?

- 340
- What is Applicant's plan for a clean-up of Bakken crude that is immersed
341 in the water column of Lake Oahe?
 - Has Applicant researched and incorporated into the GRP recent research
342 on technologies for the cleanup of crude oil spills immersed in the water
343 column?
344
 - Does a release under the lakebed of Oahe present a more difficult
345 problem with cleanup and the threat of a persistent source of
346 contamination 90-feet below the lakebed, to groundwater, and the
347 Missouri River system? Is there a plan for that remediation?
348
 - How does the model impact the operation of the Lake Oahe dam and the
349 Master Manual?
350

351

352 This information is critical because it tells responders what will happen in the
353 event of a spill so they can respond appropriately—i.e., where to focus their initial
354 efforts, where to place booms, and what specific sensitive ecosystems and
355 cultural resources may be in the most harms' way.

356

357 **Q. What are your concerns regarding Applicant's Risk Management Approach**
358 **for Lake Oahe?**

359 A. The DAPL Lake Oahe crossing is considered under PHMSA regulations to be a
360 High Consequence Area (HCA). As an area where a spill can have significant
361 environmental and human health consequences, Lake Oahe requires increased
362 measures for protection. These include effective risk reduction, an integrity

363 management plan that is pipeline segment specific and the application of up-to-
364 date pipeline safety standards. Applicant's risk management approach for Lake
365 Oahe has failed in all these areas. Risk management in part looks at what can
366 happen and what can be the consequences. The significant underestimation of
367 potential consequences – the WCD – is a serious risk management deficiency.
368 Lacking effective risk management, doubling the capacity of DAPL is an even
369 more serious threat to the people and environment of Lake Oahe.

370

371 Applicant committed itself in the Dakota Access Environmental Assessment to
372 “construct and maintain the pipeline to meet or exceed industry and
373 governmental requirements and standards.” However, Applicant has failed to
374 implement for DAPL key recently issued American Petroleum Institute (API)
375 pipeline standards that have been implemented specifically to prevent the
376 number of spills companies like Energy Transfer have been experiencing.

377

378 For example, API RP 1173 Pipeline Safety Management Systems (2015) is seen
379 as the best practice approach to risk management and spill prevention. RP 1173
380 is a risk analysis methodology that focuses on actual performance using a Plan-
381 Do-Check-Act approach to achieve continuous assessment and improvement.
382 For effective pipeline risk management RP 1173 would have Energy Transfer
383 assess and continuously improve its own spill performance. ET, however,
384 assessing the risk for DAPL cites generic PHMSA statistics rather than
385 examining the real risk of its own poor safety record. ET is not utilizing the RP

386 1173 modern management system approaches for spill prevention that include
387 requiring risk reduction, implementing corrective action and using metrics to drive
388 incidents to zero. API RP 1175 addressing leak detection systems would require
389 using metrics to improve detection improvement but has not been adopted by
390 Applicant for Lake Oahe. With a spill and leak detection record of serious
391 concern, Applicant's failure to adopt standards that aim to improve that
392 performance - particularly where doubling the impact is being considered - is
393 deeply concerning.

394

395 Additionally, there is no record of Applicant applying a needed Management of
396 Change review to assess the safety implications of doubling the DAPL
397 throughput. This analysis is required for such a change under API RP 1173 and
398 API RP 1160 Managing System Integrity for Hazardous Liquid Pipelines (2019).
399 RP 1160 states that an increase in throughput should also trigger an evaluation
400 of its impact on the Integrity Management Plan. It notes that such changes can
401 impact the safety of the pipeline's maintenance, operations, monitoring, integrity
402 management including the magnitude and velocity of pressure surges, corrosion
403 susceptibility, and leak detection. I encourage the NDPSC to request and
404 thoroughly evaluate these important reviews required by modern pipeline safety
405 standards.

406

407 Finally, and perhaps most concerning is that there is no record of Applicant
408 implementing an up-to-date Integrity Management Plan (IMP) as required by

409 PHMSA. An effective IMP is a vital risk management element. Under PHMSA
410 regulations an IMP must be pipeline segment specific - in other words here
411 specific to DAPL. An IMP was requested from Applicant in the Corps'
412 Environmental Assessment. In a Court ordered independent assessment, the
413 DAPL IMP was not found. There was a generic IMP document, but it lacked any
414 DAPL specific content as required by the regulation for HCAs. IMPs are a key
415 requirement developed by PHMSA to prevent hazardous liquid releases in HCAs.
416 A lack of a compliant plan is a serious issue and doubling the flow of DAPL by a
417 company that would operate a pipeline at any time without such a plan is a
418 danger to the public and the environment. The NPS should request from
419 Applicant evidence they are implementing the key API best practices referenced,
420 the detailed DAPL pipeline segment specific IMP, and any MOCs for the DAPL
421 throughput increase including specific safety changes made as a result of the
422 MOC hazard evaluation.

423

424 **Q. What do you recommend the Commission order?**

425 A. I recommend that the Commission deny Applicant's application to expand the
426 capacity of its pipeline. Applicant has failed to apply recognized industry safety
427 good practice to the design, construction, and operation of its pipeline such that,
428 even absent capacity expansion, DAPL's operation would pose unacceptable
429 risks to human, animal, and Tribal welfare, rights, and interests. Permitting
430 Applicant to double the amount of Bakken crude it transports through DAPL

431 despite Applicant's failure to develop valid risk assessments and spill response
432 plans would exponentially increase these risks.

433

434 Applicant's Energy Transfer family of pipelines have the worst safety spill record
435 in the industry. Regulatory authorities in three states in recent years have been
436 forced to suspend the operations of Energy Transfer's Sunoco because of its
437 poor safety performance. Given their poor safety record and Applicant's
438 insufficient risk assessment and response planning efforts, moving in the
439 opposite direction and permitting Applicant to double the throughput of DAPL by
440 granting the instant application would create unacceptable risks to the Standing
441 Rock Sioux Tribe as well as the citizens of North Dakota.

442

443 In addition, the Commission should order Applicant to produce to the
444 Commission and to SRST as Intervenors to allow for independent verification
445 and assessment the important documents and data described in my testimony,
446 including:

- 447 1. An up-to date and DAPL-specific Integrity Management Plan (IMP) that
448 complies with PHMSA regulations and industry standards.
- 449 2. Proof that the DAPL Capacity Expansion adheres to all applicable API
450 best practices, including RP 1173 (Pipeline Safety Management Systems),
451 RP 1175 (Leak Detection Program Management), RP 1160 (Managing
452 System Integrity for Hazardous Liquid Pipelines), and RP 1130
453 (Computational Pipeline Monitoring for Liquids).

- 454 3. An updated WCD for the DAPL Capacity Expansion that properly
455 incorporates all factors required by PHMSA regulations.
- 456 4. A revised spill model based on the updated WCD and corresponding
457 changes to the DAPL Facility Response Plan and Lake Oahe Geographic
458 Response Plan.

459

460 **Q. Does this conclude your testimony?**

461 **A. It does.**

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Key Qualifications

Over 35 years of experience conducting chemical incident investigations for the oil industry and US government. Seventeen years of experience managing and leading chemical incident investigation and recommendations activities at the US Chemical Safety Board (CSB), a non-regulatory, scientific agency modeled after the National Transportation Safety Board (NTSB). Nineteen years of industry experience in oil industry operations, process safety systems and extensive involvement with incident investigation in process plants, pipelines and exploration and production. Recognized leadership in process safety problem solving. Broad knowledge of safety practices, standards and regulations. Demonstrated ability as a writer and public speaker.

Work Experience

US Chemical Safety and Hazard Investigation Board (1999-2016, retired 11-1-16)

Director, Western Regional Office (WRO) (2008-2016)

- Managed and/or led over 70 major accident investigations - many of the largest and most significant chemical incident investigations in recent US history including the 2005 BP Texas City explosion, the 2010 Tesoro Anacortes oil refinery fire, the 2010 Deepwater Horizon offshore fire and explosion and the 2012 Chevron Richmond, CA oil refinery fire.
- Developed and successfully advocated the implementation of important technical, safety standard and regulatory recommendations that were addressed to parties such as the National Fire Protection Association (NFPA), the American Petroleum Institute (API), National Association of Corrosion Engineers (NACE), the Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency (EPA).
- Responsibilities included managing multi-disciplinary teams of chemical and mechanical engineers, chemists, human factors specialists, and lawyers – approximately two thirds of the agency investigators reported to the WRO.

Total Petroleum Inc./Ultramar Diamond Shamrock/Asamera Oil (1981-1999)

Operations and Process Safety (1981-1999)

- Participated in and led numerous chemical accident investigations. Implemented the first root cause analysis and process hazard analysis activities at Total Petroleum Inc. in response to serious process safety issues. These activities led to establishing new procedures for incident investigation, the elimination of unsafe refinery equipment, process winterization, decommissioning process equipment, establishment of more rigorous mechanical integrity protocols, asbestos handling protocols for insulation removal, and safe lighting of fired heaters.

Additional Experience

- Numerous technical certifications and/or training related to fire and explosion investigation, hazardous materials, mechanical integrity, root cause determination, human factors analysis, chemical testing, and emergency response.
- Speaker on CSB investigation reports and recommendations to such organizations as API, the American Industrial Hygienist Association (AIHA), the Center for Chemical Process Safety (CCPS), the Department of Energy (DOE), the Pipeline and Hazardous Materials Safety Administration (PHMSA), the International Association of Drilling Contractors (IADC), Exxon Mobil, Covestro, and the Society of Petroleum Engineers (SPE).
- Author or co-author of numerous articles on incident investigation and process safety in publications such as Chemical Engineering Progress, Loss Prevention Bulletin, Process Safety Progress, Journal of Hazardous Materials and the NFPA Journal.
- Served on the 2014 Technical Panel for the project "Separation Distances in NFPA Codes and Standards" undertaken by The Fire Protection Research Foundation, an affiliate of NFPA.
- Served as a member of the 2019 National Academy of Science Gulf Research Program's Safer Offshore Energy Systems Grants Review

Education

University of Colorado School of Law, Juris Doctor, 1978

Stanford University, Bachelor of Arts (Human Biology and English), 1974

Interests

River running, hunting and fishing in the Rocky Mountains