

# QUALITATIVE STRUCTURAL EVALUATION

Program/Project: CPRM

T. E. Bratvold  
CH2M HILL Plateau Remediation Company

Date Published  
October 2019

Prepared for the U.S. Department of Energy  
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy  
under Contract DE-AC06-08RL14788

**CH2MHILL**  
Plateau Remediation Company  
P.O. Box 1600  
Richland, Washington 99352

**APPROVED**  
*By Julia Raymer at 9:19 am, Oct 16, 2019*

---

Release Approval

Date

**APPENDIX A**

**DETAILED SCORING BASIS TABLES FOR EACH STRUCTURE**

**Table A-1. 216-B-7A/B Cribs Scoring Basis.**

<b>216-B-7A/B CRIBS</b>		<b>GROUP</b>	<b>C1</b>
<b>PROBABILITY OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
1-A. Construction Type/Material is Prone to Failure	Construction type is highly prone to failure. Constructed of 6-in. by 6-in. wooden timbers. The buried timbers can be expected to deteriorate with time.	<b>8</b>	
1-B. Construction Similar to Other Structures that have Failed	Construction is very similar to other structures that have failed. Several similar cribs have already failed.	<b>8</b>	
1-C. Waste Stream Chemistry	Waste stream chemistry is unknown because reliable data is not readily available. Scored midrange due to this uncertainty.	<b>4</b>	
<b>CONSEQUENCE OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
2-A. Failing into a Safe Configuration	Soil overburden is much greater than structure height. Failure is expected to result in a safe configuration. Most probable failure result is ground subsidence without breaching the crib, consistent with similar cribs that have failed. Crib height is 4 ft with 24 ft of soil overburden.	<b>1</b>	
2-B. Amount/Type of Material that Could be Released	Material inventory is unknown but expected to be limited. Detailed information concerning material inventory is not readily available. Scored midrange due to this uncertainty.	<b>5</b>	
2-C. Proximity to Workers	Proximity to workers is approximately 25 ft from pump and treat equipment at 241-B Tank Farm.	<b>10</b>	
2-D. Extent of Recovery Effort	Recovery efforts modest. Primarily back filling and stabilizing the area which should not require extensive planning or worker precautions.	<b>2</b>	

**Table A-2. 216-B-8 Crib Scoring Basis.**

216-B-8 CRIB		GROUP	C1
<b>PROBABILITY OF FAILURE</b>			
CRITERIA	BASIS	SCORE	
1-A. Construction Type/Material is Prone to Failure	Construction type is highly prone to failure. Constructed of 6-in. by 6-in. wooden timbers. The buried timbers can be expected to deteriorate with time.	<b>8</b>	
1-B. Construction Similar to Other Structures that have Failed	Construction is very similar to other structures that have failed. Several similar cribs have already failed <sup>1</sup> .	<b>8</b>	
1-C. Waste Stream Chemistry	Waste stream chemistry is unknown because reliable data is not readily available. Scored midrange due to this uncertainty.	<b>4</b>	
<b>CONSEQUENCE OF FAILURE</b>			
CRITERIA	BASIS	SCORE	
2-A. Failing into a Safe Configuration	Soil overburden is much greater than structure height. Failure is expected to result in a safe configuration <sup>2</sup> . Most probable failure result is ground subsidence without breaching the crib, consistent with similar cribs that have failed. Crib height is 7 ft with 16 ft of soil overburden.	<b>2</b>	
2-B. Amount/Type of Material that Could be Released	Material inventory is unknown but expected to be limited. Detailed information concerning material inventory is not readily available. Scored midrange due to this uncertainty.	<b>5</b>	
2-C. Proximity to Workers	Proximity to workers is approximately 170 ft from pump and treat equipment at 241-B Tank Farm.	<b>7</b>	
2-D. Extent of Recovery Effort	Recovery efforts modest. Primarily back filling and stabilizing the area which should not require extensive planning or worker precautions.	<b>2</b>	

- <sup>1</sup>. In March 2016, during a drilling activity near this structure, a cave-in (subsidence) occurred near the drill rig.
- <sup>2</sup>. Structures that have already subsided or caved in have been scored as if they have not yet failed. The extent of the cave-in is unknown and there is continued risk of additional cave-ins; therefore, these structures may still be considered for further evaluation.

**Table A-3. 216-B-9 Crib Scoring Basis.**

<b>216-B-9 CRIB</b>		<b>GROUP</b>	<b>C1</b>
<b>PROBABILITY OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
1-A. Construction Type/Material is Prone to Failure	Construction type is highly prone to failure. Constructed of 6-in. by 6-in. wooden timbers. The buried timbers can be expected to deteriorate with time.	<b>8</b>	
1-B. Construction Similar to Other Structures that have Failed	Construction is very similar to other structures that have failed. Several similar cribs have already failed.	<b>8</b>	
1-C. Waste Stream Chemistry	The waste stream chemistry was highly corrosive. Sludge in the waste plugged the crib and decreased its capacity. Acid was added to the crib to keep it in operation. The crib eventually became sealed with sludge and overflow into the tile field began in November 1948.	<b>8</b>	
<b>CONSEQUENCE OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
2-A. Failing into a Safe Configuration	Soil overburden is much greater than structure height. Failure is expected to result in a safe configuration. Most probable failure result is ground subsidence without breaching the crib, consistent with similar cribs that have failed. Crib height is 8 ft with 22-ft of soil overburden.	<b>2</b>	
2-B. Amount/Type of Material that Could be Released	Material inventory is small. A total of 4,860,000 gallons of waste was discharged to the crib between August 1948 and January 1950. The waste contained approximately 95-grams of plutonium and 2,050-curies of fission products.	<b>3</b>	
2-C. Proximity to Workers	Proximity to workers is approximately 1250 ft from mobile offices north of B Plant.	<b>1</b>	
2-D. Extent of Recovery Effort	Recovery efforts modest. Primarily back filling and stabilizing the area which should not require extensive planning or worker precautions.	<b>2</b>	

**Table A-4. 216-B-10A/B Cribs Scoring Basis.**

216-B-10A/B CRIBS		GROUP	C1
<b>PROBABILITY OF FAILURE</b>			
CRITERIA	BASIS	SCORE	
1-A. Construction Type/Material is Prone to Failure	Construction type is highly prone to failure. Constructed of 6-in. by 6-in. wooden timbers. The buried timbers can be expected to deteriorate with time.	<b>8</b>	
1-B. Construction Similar to Other Structures that have Failed	Construction is very similar to other structures that have failed. Several similar cribs have already failed <sup>1</sup> .	<b>8</b>	
1-C. Waste Stream Chemistry	Waste stream chemistry is unknown because reliable data is not readily available. Scored midrange due to this uncertainty.	<b>4</b>	
<b>CONSEQUENCE OF FAILURE</b>			
CRITERIA	BASIS	SCORE	
2-A. Failing into a Safe Configuration	Soil overburden is much greater than structure height. Failure is expected to result in a safe configuration <sup>2</sup> . Most probable failure result is ground subsidence without breaching the crib, consistent with similar cribs that have failed. Crib height is 4 ft with 16 ft of soil overburden.	<b>1</b>	
2-B. Amount/Type of Material that Could be Released	Material inventory is unknown but expected to be limited. Detailed information concerning material inventory is not readily available. Scored midrange due to this uncertainty.	<b>5</b>	
2-C. Proximity to Workers	Proximity to workers is approximately 575 ft from mobile offices north of B Plant.	<b>4</b>	
2-D. Extent of Recovery Effort	Recovery efforts modest. Primarily back filling and stabilizing the area which should not require extensive planning or worker precautions.	<b>2</b>	

- <sup>1.</sup> The surface of the unit has subsided about 3 ft in the center, possibly indicating deterioration of the lumber.
- <sup>2.</sup> Structures that have already subsided or caved in have been scored as if they have not yet failed. The extent of the cave-in is unknown and there is continued risk of additional cave-ins; therefore, these structures may still be considered for further evaluation.

**Table A-5. 216-T-6 Crib Scoring Basis.**

<b>216-T-6 CRIB</b>		<b>GROUP</b>	<b>C1</b>
<b>PROBABILITY OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
1-A. Construction Type/Material is Prone to Failure	Construction type is highly prone to failure. Constructed of 6-in. by 6-in. wooden timbers. The buried timbers can be expected to deteriorate with time.	<b>8</b>	
1-B. Construction Similar to Other Structures that have Failed	Construction is very similar to other structures that have failed. Several similar cribs have already failed <sup>1</sup> .	<b>8</b>	
1-C. Waste Stream Chemistry	Waste stream chemistry was diluted. Low in salt, neutral to basic, and contained nitrate, sodium, ammonium nitrate, sodium oxalate, fluoride, sulfate, and phosphate.	<b>3</b>	
<b>CONSEQUENCE OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
2-A. Failing into a Safe Configuration	Soil overburden is much greater than structure height. Failure is expected to result in a safe configuration <sup>2</sup> . Most probable failure result is ground subsidence without breaching the crib, consistent with similar cribs that have failed. Crib height is 4 ft with 15-ft of soil overburden.	<b>1</b>	
2-B. Amount/Type of Material that Could be Released	Material inventory is unknown but expected to be limited. Detailed information concerning material inventory is not readily available. Scored midrange due to this uncertainty.	<b>5</b>	
2-C. Proximity to Workers	Proximity to workers is approximately 725 ft from T Plant.	<b>3</b>	
2-D. Extent of Recovery Effort	Recovery efforts modest. Primarily back filling and stabilizing the area which should not require extensive planning or worker precautions.	<b>2</b>	

<sup>1</sup>. In the mid 1970's and again in 2015, holes appeared in the ground above this crib. Actions were taken to stabilize this subsidence.

<sup>2</sup>. Structures that have already subsided or caved in have been scored as if they have not yet failed. The extent of the cave-in is unknown and there is continued risk of additional cave-ins; therefore, these structures may still be considered for further evaluation.

**Table A-6. 216-T-7 Crib Scoring Basis.**

<b>216-T-7 CRIB</b>		<b>GROUP</b>	<b>C1</b>
<b>PROBABILITY OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
1-A. Construction Type/Material is Prone to Failure	Construction type is highly prone to failure. Constructed of 6-in. by 6-in. wooden timbers. The buried timbers can be expected to deteriorate with time.	<b>8</b>	
1-B. Construction Similar to Other Structures that have Failed	Construction is very similar to other structures that have failed. Several similar cribs have already failed.	<b>8</b>	
1-C. Waste Stream Chemistry	Waste stream chemistry was diluted. High in salt, neutral to basic, and contained nitrate, potassium, sodium, ammonium nitrate, sodium oxalate, fluoride, sulfate, and phosphate.	<b>3</b>	
<b>CONSEQUENCE OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
2-A. Failing into a Safe Configuration	Soil overburden is much greater than structure height. Failure is expected to result in a safe configuration. Most probable failure result is ground subsidence without breaching the crib, consistent with similar cribs that have failed. Crib height is 7 ft with 19- ft of soil overburden.	<b>2</b>	
2-B. Amount/Type of Material that Could be Released	Material inventory is unknown but expected to be limited. Detailed information concerning material inventory is not readily available. Scored midrange due to this uncertainty.	<b>5</b>	
2-C. Proximity to Workers	Proximity to workers is located within 241-T Tank Farm.	<b>10</b>	
2-D. Extent of Recovery Effort	Recovery efforts modest. Primarily back filling and stabilizing the area which should not require extensive planning or worker precautions.	<b>2</b>	



**Table A-7. 216-T-8 Crib Scoring Basis.**

<b>216-T-8 CRIB</b>		<b>GROUP</b>	<b>C1</b>
<b>PROBABILITY OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
1-A. Construction Type/Material is Prone to Failure	Construction type is highly prone to failure. Constructed of 6-in. by 6-in. wooden timbers. The buried timbers can be expected to deteriorate with time.	<b>8</b>	
1-B. Construction Similar to Other Structures that have Failed	Construction is very similar to other structures that have failed. Several similar cribs have already failed.	<b>8</b>	
1-C. Waste Stream Chemistry	Waste stream chemistry was diluted. Neutral to basic.	<b>3</b>	
<b>CONSEQUENCE OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
2-A. Failing into a Safe Configuration	Soil overburden is much greater than structure height. Failure is expected to result in a safe configuration. Most probable failure result is ground subsidence without breaching the crib, consistent with similar cribs that have failed. Crib height is 4 ft with 16 ft of soil overburden.	<b>1</b>	
2-B. Amount/Type of Material that Could be Released	Material inventory is unknown but expected to be limited. Detailed information concerning material inventory is not readily available. Scored midrange due to this uncertainty.	<b>5</b>	
2-C. Proximity to Workers	Proximity to workers is approximately 135 ft from T Plant.	<b>8</b>	
2-D. Extent of Recovery Effort	Recovery efforts modest. Primarily back filling and stabilizing the area which should not require extensive planning or worker precautions.	<b>2</b>	

**Table A-8. 216-T-19 Crib Scoring Basis.**

216-T-19 CRIB		GROUP	C1
PROBABILITY OF FAILURE			
CRITERIA	BASIS	SCORE	
1-A. Construction Type/Material is Prone to Failure	Construction type is highly prone to failure. Constructed of 6-in. by 6-in. wooden timbers. The buried timbers can be expected to deteriorate with time.	8	
1-B. Construction Similar to Other Structures that have Failed	Construction is very similar to other structures that have failed. Several similar cribs have already failed <sup>1</sup> .	8	
1-C. Waste Stream Chemistry	Waste stream chemistry was mildly corrosive. Process condensate from the waste evaporator in 242-T, cell drainage from Tank 5-6, second-cycle supernatant waste from 221-T, and waste from the 224-T Building.	4	
CONSEQUENCE OF FAILURE			
CRITERIA	BASIS	SCORE	
2-A. Failing into a Safe Configuration	Soil overburden is much greater than structure height. Failure is expected to result in a safe configuration <sup>2</sup> . Most probable failure result is ground subsidence without breaching the crib, consistent with similar cribs that have failed. Crib height is 9 ft with 21 ft of soil overburden.	2	
2-B. Amount/Type of Material that Could be Released	Material inventory is unknown but expected to be limited. Detailed information concerning material inventory is not readily available. Scored midrange due to this uncertainty.	5	
2-C. Proximity to Workers	Proximity to workers is approximately 300 ft from storage area.	5	
2-D. Extent of Recovery Effort	Recovery efforts modest. Primarily back filling and stabilizing the area which should not require extensive planning or worker precautions.	2	

<sup>1</sup>. A cave-in occurred in 1956 that resulted in the abandonment of the wooden crib.

<sup>2</sup>. Structures that have already subsided or caved in have been scored as if they have not yet failed. The extent of the cave-in is unknown and there is continued risk of additional cave-ins; therefore, these structures may still be considered for further evaluation.

**Table A-9. 216-T-32 Crib Scoring Basis.**

<b>216-T-32 CRIB</b>		<b>GROUP</b>	<b>C1</b>
<b>PROBABILITY OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
1-A. Construction Type/Material is Prone to Failure	Construction type is highly prone to failure. Constructed of 6-in. by 6-in. wooden timbers. The buried timbers can be expected to deteriorate with time.	<b>8</b>	
1-B. Construction Similar to Other Structures that have Failed	Construction is very similar to other structures that have failed. Several similar cribs have already failed.	<b>8</b>	
1-C. Waste Stream Chemistry	Waste stream chemistry is mildly corrosive. The site received waste from 224-T via the 241-T-201 Tank. The waste was high in salt, neutral to basic, and contained nitrate, sodium, ammonium nitrate, sodium oxalate, fluoride, sulfate, and phosphate.	<b>4</b>	
<b>CONSEQUENCE OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
2-A. Failing into a Safe Configuration	Soil overburden is much greater than structure height. Failure is expected to result in a safe configuration. Most probable failure result is ground subsidence without breaching the crib, consistent with similar cribs that have failed. Crib height is 4 ft with 22-ft of soil overburden.	<b>1</b>	
2-B. Amount/Type of Material that Could be Released	Some material inventory. 3.2-kg plutonium.	<b>6</b>	
2-C. Proximity to Workers	Proximity to workers is located within 241-T Tank Farm.	<b>10</b>	
2-D. Extent of Recovery Effort	Recovery efforts modest. Primarily back filling and stabilizing the area which should not require extensive planning or worker precautions.	<b>2</b>	

**Table A-10. 216-U-1 Crib Scoring Basis.**

<b>216-U-1 CRIB</b>		<b>GROUP</b>	<b>C1</b>
<b>PROBABILITY OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
1-A. Construction Type/Material is Prone to Failure	Construction type is highly prone to failure. Constructed of 6-in. by 6-in. wooden timbers. The buried timbers can be expected to deteriorate with time.	<b>8</b>	
1-B. Construction Similar to Other Structures that have Failed	Construction is very similar to other structures that have failed. Several similar cribs have already failed.	<b>8</b>	
1-C. Waste Stream Chemistry	Waste stream chemistry was mildly corrosive. Low in salt and neutral to basic.	<b>4</b>	
<b>CONSEQUENCE OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
2-A. Failing into a Safe Configuration	Soil overburden is much greater than structure height. Failure is expected to result in a safe configuration. Most probable failure result is ground subsidence without breaching the crib, consistent with similar cribs that have failed. Crib height is 4 ft with 20-ft of soil overburden.	<b>1</b>	
2-B. Amount/Type of Material that Could be Released	Material inventory is unknown but expected to be limited. Detailed information concerning material inventory is not readily available. Scored midrange due to this uncertainty.	<b>5</b>	
2-C. Proximity to Workers	Proximity to workers is approximately 750 ft from U Plant.	<b>3</b>	
2-D. Extent of Recovery Effort	Recovery efforts modest. Primarily back filling and stabilizing the area which should not require extensive planning or worker precautions.	<b>2</b>	

**Table A-11. 216-U-2 Crib Scoring Basis.**

<b>216-U-2 CRIB</b>		<b>GROUP</b>	<b>C1</b>
<b>PROBABILITY OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
1-A. Construction Type/Material is Prone to Failure	Construction type is highly prone to failure. Constructed of 6-in. by 6-in. wooden timbers. The buried timbers can be expected to deteriorate with time.	<b>8</b>	
1-B. Construction Similar to Other Structures that have Failed	Construction is very similar to other structures that have failed. Several similar cribs have already failed.	<b>8</b>	
1-C. Waste Stream Chemistry	Waste stream chemistry was mildly corrosive. Low in salt and neutral to basic.	<b>4</b>	
<b>CONSEQUENCE OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
2-A. Failing into a Safe Configuration	Soil overburden is much greater than structure height. Failure is expected to result in a safe configuration. Most probable failure result is ground subsidence without breaching the crib, consistent with similar cribs that have failed. Crib height is 4 ft with 19-ft of soil overburden.	<b>1</b>	
2-B. Amount/Type of Material that Could be Released	Material inventory is unknown but expected to be limited. Detailed information concerning material inventory is not readily available. Scored midrange due to this uncertainty.	<b>5</b>	
2-C. Proximity to Workers	Proximity to workers is approximately 750 ft from U Plant.	<b>3</b>	
2-D. Extent of Recovery Effort	Recovery efforts modest. Primarily back filling and stabilizing the area which should not require extensive planning or worker precautions.	<b>2</b>	

**Table A-12. 216-U-8 Crib Scoring Basis.**

216-U-8 CRIB		GROUP	C1
PROBABILITY OF FAILURE			
CRITERIA	BASIS	SCORE	
1-A. Construction Type/Material is Prone to Failure	Construction type is highly prone to failure. Constructed of 6-in. by 8-in. wooden timbers. The buried timbers can be expected to deteriorate with time.	8	
1-B. Construction Similar to Other Structures that have Failed	Construction is very similar to other structures that have failed. Several similar cribs have already failed <sup>1</sup> .	8	
1-C. Waste Stream Chemistry	Waste stream chemistry was highly corrosive. Acidic process condensate from the 221-U and 224-U Buildings along with drainage from the 291-U Stack.	8	
CONSEQUENCE OF FAILURE			
CRITERIA	BASIS	SCORE	
2-A. Failing into a Safe Configuration	Soil overburden is much greater than structure height. Failure is expected to result in a safe configuration <sup>2</sup> . Most probable failure result is ground subsidence without breaching the crib, consistent with similar cribs that have failed. Crib height is 10 ft with 18-ft of soil overburden.	3	
2-B. Amount/Type of Material that Could be Released	Material inventory is unknown but expected to be limited. Detailed information concerning material inventory is not readily available. Scored midrange due to this uncertainty.	5	
2-C. Proximity to Workers	Proximity to workers is approximately 1300 ft from U Plant.	1	
2-D. Extent of Recovery Effort	Recovery efforts modest. Primarily back filling and stabilizing the area which should not require extensive planning or worker precautions.	2	

- <sup>1</sup>. Ground settling occurred in 1960 around the crib vent risers. Approximately 75 cubic yards of dirt was used to fill the sink holes.
- <sup>2</sup>. Structures that have already subsided or caved in have been scored as if they have not yet failed. The extent of the cave-in is unknown and there is continued risk of additional cave-ins; therefore, these structures may still be considered for further evaluation.

**Table A-13: 216-Z-1 Crib Scoring Basis**

216-Z-1 CRIB		GROUP	C1
PROBABILITY OF FAILURE			
CRITERIA	BASIS	SCORE	
1-A. Construction Type/Material is Prone to Failure	Construction type is highly prone to failure. Constructed of 6-in. by 6-in. wooden timbers. The buried timbers can be expected to deteriorate with time.	8	
1-B. Construction Similar to Other Structures that have Failed	Construction is very similar to other structures that have failed. Several similar cribs have already failed <sup>1</sup> .	8	
1-C. Waste Stream Chemistry	Waste stream chemistry was mildly corrosive. Process, analytical and development lab wastes from 234-5Z via the 214-Z-361 Settling Tank from June 1949 to June 1952; May 1966 to May 1966 received 236-Z aqueous and organic waste and 242-Z waste; October 1967 to October 1967 received 236-Z and 242-Z wastes; and March 1968 to April 1969 received 236-Z uranium wastes.	6	
CONSEQUENCE OF FAILURE			
CRITERIA	BASIS	SCORE	
2-A. Failing into a Safe Configuration	Soil overburden is less than structure height. Failure may result in an unsafe configuration <sup>2</sup> . Most probable failure result is cave-in, with possible breaching of the crib. Crib height is 14 ft with 6-ft of soil overburden.	7	
2-B. Amount/Type of Material that Could be Released	Some material inventory that could be released. Approximately 3.5-kg of plutonium and 40.5-kg uranium.	7	
2-C. Proximity to Workers	Proximity to workers is approximately 240 ft from PFP demolition.	6	
2-D. Extent of Recovery Effort	Recovery efforts moderate. Failure would likely result in a significant cave-in, rather than mere subsidence, with a high probability of contamination spread resulting in extensive cleanup.	5	

- <sup>1</sup>. An area approximately 10 ft in diameter by 6 to 8 ft deep collapsed on August 16, 2016 and was backfilled with approximately 24 yards of Controlled Density Fill on January 25, 2017. No parts of the in/out piping or crib interior were exposed.
- <sup>2</sup>. Structures that have already subsided or caved in have been scored as if they have not yet failed. The extent of the cave-in is unknown and there is continued risk of additional cave-ins; therefore, these structures may still be considered for further evaluation.

**Table A-14. 216-Z-2 Crib Scoring Basis.**

<b>216-Z-2 CRIB</b>		<b>GROUP</b>	<b>C1</b>
<b>PROBABILITY OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
1-A. Construction Type/Material is Prone to Failure	Construction type is highly prone to failure. Constructed of 6-in. by 6-in. wooden timbers. The buried timbers can be expected to deteriorate with time.	<b>8</b>	
1-B. Construction Similar to Other Structures that have Failed	Construction is very similar to other structures that have failed. Several similar cribs have already failed.	<b>8</b>	
1-C. Waste Stream Chemistry	Waste stream chemistry was mildly corrosive. Process, analytical and development lab wastes from 234-5Z via the 214-Z-361 Settling Tank from June 1949 to June 1952; May 1966 to May 1966 received 236-Z aqueous and organic waste and 242-Z waste; October 1967 to October 1967 received 236-Z and 242-Z wastes; and March 1968 to April 1969 received 236-Z uranium wastes.	<b>6</b>	
<b>CONSEQUENCE OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
2-A. Failing into a Safe Configuration	Soil overburden is less than structure height. Failure may result in an unsafe configuration. Most probable failure result is cave-in, with possible breaching of the crib. Crib height is 14 ft with 6-ft of soil overburden.	<b>7</b>	
2-B. Amount/Type of Material that Could be Released	Some material inventory that could be released. Approximately 3.5-kg of plutonium and 40.5-kg uranium.	<b>7</b>	
2-C. Proximity to Workers	Proximity to workers is approximately 240 ft from PFP demolition.	<b>6</b>	
2-D. Extent of Recovery Effort	Recovery efforts moderate. Failure would likely result in a significant cave-in, rather than mere subsidence, with a high probability of contamination spread resulting in extensive cleanup.	<b>5</b>	



**Table A-15. 216-Z-5 Crib Scoring Basis.**

<b>216-Z-5 CRIB</b>		<b>GROUP</b>	<b>C1</b>
<b>PROBABILITY OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
1-A. Construction Type/Material is Prone to Failure	Construction type is highly prone to failure. Constructed of 6- in. by 6-in. wooden timbers. The buried timbers can be expected to deteriorate with time.	<b>8</b>	
1-B. Construction Similar to Other Structures that have Failed	Construction is very similar to other structures that have failed. Several similar cribs have already failed.	<b>8</b>	
1-C. Waste Stream Chemistry	Waste stream chemistry was mildly corrosive. Process waste from the 231-Z Building.	<b>4</b>	
<b>CONSEQUENCE OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
2-A. Failing into a Safe Configuration	Soil overburden is much greater than structure height. Failure is expected to result in a safe configuration. Most probable failure result is ground subsidence without breaching the crib, consistent with similar cribs that have failed. Crib height is 4 ft with 14-ft of soil overburden.	<b>1</b>	
2-B. Amount/Type of Material that Could be Released	Some material inventory that could be released. Approximately 340-g of plutonium and 100,000-kg Nitrate.	<b>4</b>	
2-C. Proximity to Workers	Proximity to workers is approximately 160 ft from 231-Z at PFP.	<b>7</b>	
2-D. Extent of Recovery Effort	Recovery efforts modest. Primarily back filling and stabilizing the area which should not require extensive planning or worker precautions.	<b>2</b>	

**Table A-16. 216-B-12 Crib Scoring Basis.**

<b>216-B-12 CRIB</b>		<b>GROUP</b>	<b>C2</b>
<b>PROBABILITY OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
1-A. Construction Type/Material is Prone to Failure	Construction type is highly prone to failure. Constructed of 6-in. by 8-in. wooden timbers. The buried timbers can be expected to deteriorate with time.	<b>8</b>	
1-B. Construction Similar to Other Structures that have Failed	Construction is very similar to other structures that have failed. Several similar cribs have already failed <sup>1</sup> .	<b>8</b>	
1-C. Waste Stream Chemistry	Waste stream chemistry was diluted. Condensate wastes from various sources.	<b>2</b>	
<b>CONSEQUENCE OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
2-A. Failing into a Safe Configuration	Soil overburden is much greater than structure height. Failure is expected to result in a safe configuration <sup>2</sup> . Most probable failure result is ground subsidence without breaching the crib, consistent with similar cribs that have failed. Crib height is 10 ft with 15-ft of soil overburden.	<b>3</b>	
2-B. Amount/Type of Material that Could be Released	Material inventory is unknown but expected to be limited. Detailed information concerning material inventory is not readily available. Scored midrange due to this uncertainty.	<b>5</b>	
2-C. Proximity to Workers	Proximity to workers is approximately 900 ft from mobile offices north of B Plant.	<b>2</b>	
2-D. Extent of Recovery Effort	Recovery efforts modest. Primarily back filling and stabilizing the area which should not require extensive planning or worker precautions.	<b>2</b>	

<sup>1</sup>. A crib collapse occurred in 1973. The subsidence had been gradual, with the final depression measuring approximately 5 ft. The collapse was not open to the crib and was backfilled to grade.

<sup>2</sup>. Structures that have already subsided or caved in have been scored as if they have not yet failed. The extent of the cave-in is unknown and there is continued risk of additional cave-ins; therefore, these structures may still be considered for further evaluation.

**Table A-17. 216-Z-6 Crib Scoring Basis.**

<b>216-Z-6 CRIB</b>		<b>GROUP</b>	<b>C3</b>
<b>PROBABILITY OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
1-A. Construction Type/Material is Prone to Failure	Construction type is highly prone to failure. Constructed of 6-in. by 8-in. wooden timbers. The buried timbers can be expected to deteriorate with time.	<b>8</b>	
1-B. Construction Similar to Other Structures that have Failed	Construction is very similar to other structures that have failed. Several similar cribs have already failed <sup>1</sup> .	<b>8</b>	
1-C. Waste Stream Chemistry	Waste stream chemistry was mildly corrosive. Process waste from the 231-Z Building. The site was only used for one month and abandoned due to plugging of the surrounding soil by process sludge and precipitates.	<b>6</b>	
<b>CONSEQUENCE OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
2-A. Failing into a Safe Configuration	Soil overburden is greater than structure height. Failure is expected to result in a safe configuration <sup>2</sup> . Most probable failure result is ground subsidence without breaching the crib, consistent with similar cribs that have failed. Crib height is 4 ft with 6-ft of soil overburden.	<b>3</b>	
2-B. Amount/Type of Material that Could be Released	Material inventory is unknown but expected to be limited. Detailed information concerning material inventory is not readily available. Scored midrange due to this uncertainty.	<b>5</b>	
2-C. Proximity to Workers	Proximity to workers is approximately 170 ft from PFP demolition.	<b>7</b>	
2-D. Extent of Recovery Effort	Recovery efforts modest. Primarily back filling and stabilizing the area which should not require extensive planning or worker precautions.	<b>2</b>	

<sup>1</sup> There have been previous cave-ins at this site and there is a potential for further collapse.

<sup>2</sup> Structures that have already subsided or caved in have been scored as if they have not yet failed. The extent of the cave-in is unknown and there is continued risk of additional cave-ins; therefore, these structures may still be considered for further evaluation.

**Table A-18. 216-Z-7 Crib Scoring Basis.**

<b>216-Z-7 CRIB</b>		<b>GROUP</b>	<b>C4</b>
<b>PROBABILITY OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
1-A. Construction Type/Material is Prone to Failure	Construction type is highly prone to failure. Constructed of three tiers of wooden timbers and wooden plank decking. The buried wood can be expected to deteriorate with time.	<b>8</b>	
1-B. Construction Similar to Other Structures that have Failed	Construction is very similar to other structures that have failed. Several similar cribs have already failed.	<b>8</b>	
1-C. Waste Stream Chemistry	Waste stream chemistry was mildly corrosive. Process waste from the 231-Z Building and 300 Area from 1947 to 1967.	<b>6</b>	
<b>CONSEQUENCE OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
2-A. Failing into a Safe Configuration	Soil overburden is much greater than structure height. Failure is expected to result in a safe configuration. Most probable failure result is ground subsidence without breaching the crib, consistent with similar cribs that have failed. Crib height is 3 ft with 9 ft of soil overburden.	<b>2</b>	
2-B. Amount/Type of Material that Could be Released	Material inventory is unknown but expected to be limited. Detailed information concerning material inventory is not readily available. Scored midrange due to this uncertainty.	<b>5</b>	
2-C. Proximity to Workers	Proximity to workers is approximately 70 ft from PFP demolition.	<b>9</b>	
2-D. Extent of Recovery Effort	Recovery efforts modest. Primarily back filling and stabilizing the area which should not require extensive planning or worker precautions.	<b>2</b>	

**Table A-19. 216-Z-9 Crib Scoring Basis.**

<b>216-Z-9 CRIB</b>		<b>GROUP</b>	<b>C5</b>
<b>PROBABILITY OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
1-A. Construction Type/Material is Prone to Failure	Failure due to construction type/materials is high. This crib is a rectangular, enclosed trench supported on the sides with a 9-in. thick concrete cover and six internal concrete columns. The underside of the cover is lined with acid resistant bricks. The concrete cover is expected to deteriorate slowly, but this structure is scored high due to the unknown durability of the complex construction and visual evidence that the clay pipe on the columns and the liner bricks have deteriorated.	<b>7</b>	
1-B. Construction Similar to Other Structures that have Failed	No similar structures so this structure is scored mid-range.	<b>5</b>	
1-C. Waste Stream Chemistry	Waste stream chemistry was mildly corrosive. Aqueous and organic liquid waste, including solvent, from RECUPLEX operations at PFP.	<b>6</b>	
<b>CONSEQUENCE OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
2-A. Failing into a Safe Configuration	No soil overburden. Failure would result in open breach of the trench.	<b>10</b>	
2-B. Amount/Type of Material that Could be Released	Large material inventory. 48-kg Plutonium, 2.5-kg Americium, 300,000-liters Carbon Tetrachloride, 27,900-liters Tributyl Phosphate, 46,500-liters Dibutyl butylphosphonate, 9,300-liters Oil, and 1,361,000-kg Nitrate.	<b>10</b>	
2-C. Proximity to Workers	Proximity to workers is approximately 170 ft from PFP mobile offices.	<b>7</b>	
2-D. Extent of Recovery Effort	Recovery efforts expected to be extensive. Immediate actions of take cover and access restrictions to the area. Extensive planning and protective measures would be required to ensure worker safety and prevent spread of contamination during recovery operations.	<b>10</b>	

**Table A-20. 241-B-361 Tank Scoring Basis.**

241-B-361 TANK		GROUP	T1
PROBABILITY OF FAILURE			
CRITERIA	BASIS	SCORE	
1-A. Construction Type/Material is Prone to Failure	Failure due to construction type/materials is unlikely. This is an underground, unlined, cylindrical concrete tank, 20-ft in diameter and 19-ft high made of 6 in reinforced pre-stressed concrete.	3	
1-B. Construction Similar to Other Structures that have Failed	Similar structures have not failed.	3	
1-C. Waste Stream Chemistry	Waste stream chemistry was mildly corrosive. Alkaline, low salt, low-level radioactive liquid waste from 224-B Building and Cells 5-6 of 221-B Building.	6	
CONSEQUENCE OF FAILURE			
CRITERIA	BASIS	SCORE	
2-A. Failing into a Safe Configuration	Soil overburden is less than structure height. Failure may result in open breach of the tank. Tank height is 19-ft with 6-ft of soil overburden.	8	
2-B. Amount/Type of Material that Could be Released	Some material inventory. 2.4-kg plutonium and 22,000-gallons of sludge.	6	
2-C. Proximity to Workers	Proximity to workers is approximately 900 ft from mobile offices north of B Plant.	2	
2-D. Extent of Recovery Effort	Recovery efforts expected to be moderate. Planning and protective measures would be required to ensure worker safety and prevent spread of contamination during recovery operations. Regulatory approval and oversight may be required.	5	

**Table A-21. 241-T-361 Tank Scoring Basis.**

<b>241-T-361 TANK</b>		<b>GROUP</b>	<b>T1</b>
<b>PROBABILITY OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
1-A. Construction Type/Material is Prone to Failure	Failure due to construction type/materials is unlikely. This is an underground, unlined, cylindrical concrete tank, 20-ft in diameter and 19-ft high made of 6-in. reinforced pre-stressed concrete.	<b>3</b>	
1-B. Construction Similar to Other Structures that have Failed	Similar structures have not failed.	<b>3</b>	
1-C. Waste Stream Chemistry	Waste stream chemistry was mildly corrosive. Alkaline, low salt, low-level radioactive liquid waste from 224-T Building and Cells 5-6 of 221-T Building.	<b>6</b>	
<b>CONSEQUENCE OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
2-A. Failing into a Safe Configuration	Soil overburden is less than structure height. Failure may result in open breach of the tank. Tank height is 19 ft with 6-ft of soil overburden.	<b>8</b>	
2-B. Amount/Type of Material that Could be Released	Some material inventory. 2.6-kg plutonium and 23,000-gallons of sludge.	<b>6</b>	
2-C. Proximity to Workers	Proximity to workers is approximately 550 ft from T Plant.	<b>4</b>	
2-D. Extent of Recovery Effort	Recovery efforts expected to be moderate. Planning and protective measures would be required to ensure worker safety and prevent spread of contamination during recovery operations. Regulatory approval and oversight may be required.	<b>5</b>	

**Table A-22. 241-U-361 Tank Scoring Basis.**

241-U-361 TANK		GROUP	T1
<b>PROBABILITY OF FAILURE</b>			
CRITERIA	BASIS	SCORE	
1-A. Construction Type/Material is Prone to Failure	Failure due to construction type/materials is unlikely. This is an underground, unlined, cylindrical concrete tank, 20 ft in diameter and 19 ft high made of 6-in. reinforced, pre-stressed concrete. Video inspections performed in 2006 indicate that the dome and side wall appear to be in good shape with no significant degradation.	<b>3</b>	
1-B. Construction Similar to Other Structures that have Failed	Similar structures have not failed.	<b>3</b>	
1-C. Waste Stream Chemistry	Waste stream chemistry was mildly corrosive. Low level waste from uranium recovery process in the 221-U Building and decontamination wastes from the 224-U Building.	<b>6</b>	
<b>CONSEQUENCE OF FAILURE</b>			
CRITERIA	BASIS	SCORE	
2-A. Failing into a Safe Configuration	Soil overburden is less than structure height. Failure may result in open breach of the tank. Tank height is 19 ft with 6-ft of soil overburden.	<b>8</b>	
2-B. Amount/Type of Material that Could be Released	Some material inventory. 69,000-kg uranium, 760 Ci strontium, 1,365 Ci cesium, and 26,000-gallons of sludge with additional supernate.	<b>5</b>	
2-C. Proximity to Workers	Proximity to workers is approximately 625 ft from U Plant.	<b>3</b>	
2-D. Extent of Recovery Effort	Recovery efforts expected to be moderate. Planning and protective measures would be required to ensure worker safety and prevent spread of contamination during recovery operations. Regulatory approval and oversight may be required.	<b>5</b>	



**Table A-23. 241-Z-361 Tank Scoring Basis.**

241-Z-361 TANK		GROUP	T2
PROBABILITY OF FAILURE			
CRITERIA	BASIS	SCORE	
1-A. Construction Type/Material is Prone to Failure	Failure due to construction type/materials is likely. Materials would normally be expected to be robust, however visual inspections of this tank indicate severe deterioration. This is an underground, lined, rectangular concrete tank, 28 ft long and 15 ft wide with 1-ft thick walls and 3/8-in. thick steel liner.	10	
1-B. Construction Similar to Other Structures that have Failed	No similar structures so this structure is scored mid-range.	5	
1-C. Waste Stream Chemistry	Waste stream chemistry was mildly corrosive. Low salt, liquid effluents discharged from PFP, 242-Z, and 236-Z. Waste streams were routed through the 241-Z Sump Tanks for neutralization prior to transfer to 241-Z-361 for settling.	6	
CONSEQUENCE OF FAILURE			
CRITERIA	BASIS	SCORE	
2-A. Failing into a Safe Configuration	Soil overburden is less than structure height. Failure may result in open breach of the tank. Tank height is 19 ft with 2-ft of soil overburden.	9	
2-B. Amount/Type of Material that Could be Released	Large material inventory. 29-kg plutonium and 20,000-gallons of sludge.	8	
2-C. Proximity to Workers	Proximity to workers is approximately 100 ft from PFP demolition.	9	
2-D. Extent of Recovery Effort	Recovery efforts expected to be extensive. Immediate actions of take cover and access restrictions to the area. Extensive planning and protective measures would be required to ensure worker safety and prevent spread of contamination during recovery operations.	8	

**Table A-24. 241-Z-8 Tank Scoring Basis.**

241-Z-8 TANK		GROUP	T3
PROBABILITY OF FAILURE			
CRITERIA	BASIS	SCORE	
1-A. Construction Type/Material is Prone to Failure	Failure due to construction type/materials is unknown. This is a buried horizontal steel tank, 40 ft long and 8 ft in diameter made of 5/16-in. steel or wrought iron plate and built to existing industry specifications for underground oil and gas storage tanks. The tank was shop painted and field coated with asphaltic pipe enamel, 3/32-in. thick. However, without cathodic protection and being in contact with the soil, it may have corroded over time.	5	
1-B. Construction Similar to Other Structures that have Failed	No similar structures so this structure is scored mid-range.	5	
1-C. Waste Stream Chemistry	Waste stream chemistry was highly corrosive. Used as a settling tank for back flushes of the RECUPLEX feed filters. Silica gel was used as a settling agent. The solids and silica gel were flushed to 241-Z-8 with nitric acid.	8	
CONSEQUENCE OF FAILURE			
CRITERIA	BASIS	SCORE	
2-A. Failing into a Safe Configuration	Soil overburden is slightly less than structure height. Failure may result in open breach of the tank. Tank diameter is 8 ft with 6-ft of soil overburden.	6	
2-B. Amount/Type of Material that Could be Released	Small material inventory. 38-g (possibly 1.5-kg) plutonium and 500-gallons of sludge.	5	
2-C. Proximity to Workers	Proximity to workers is approximately 70 ft from PFP mobile offices.	9	
2-D. Extent of Recovery Effort	Recovery efforts expected to be moderate. Planning and protective measures would be required to ensure worker safety and prevent spread of contamination during recovery operations.	5	

**Table A-25. PUREX Deep Bed Filters Scoring Basis.**

<b>PUREX DEEP BED FILTERS</b>		<b>GROUP</b>	<b>O1</b>
<b>PROBABILITY OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
1-A. Construction Type/Material is Prone to Failure	Failure due to construction type/materials is unknown. Structure is made of reinforced concrete, 82 ft long by 52 ft wide. Cover consists of 1-ft thick reinforced concrete cover blocks (quantity 30) approximately 18 ft long by 6 ft wide and (quantity 9) approximately 16 ft long by 6 ft wide. Water intrusion indicates a possibility that the cover is cracking, and structural rebar may have corroded.	<b>5</b>	
1-B. Construction Similar to Other Structures that have Failed	Similar structures have not failed, but not many similar structures considered.	<b>3</b>	
1-C. Waste Stream Chemistry	Waste stream chemistry was diluted. Facility ventilation air flow.	<b>2</b>	
<b>CONSEQUENCE OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
2-A. Failing into a Safe Configuration	Soil overburden is much less than structure height. Failure likely to result in open breach of the filter structure. Structure depth is 13 ft with 4 ft of soil overburden and 4-in. of shotcrete.	<b>8</b>	
2-B. Amount/Type of Material that Could be Released	Some material inventory. 4.2-kg plutonium.	<b>6</b>	
2-C. Proximity to Workers	Proximity to workers is approximately 185 ft from PUREX.	<b>7</b>	
2-D. Extent of Recovery Effort	Recovery efforts expected to be extensive. The filter is active and in service, required to support continued operation of the facility ventilation system. Failure would have immediate impact on system operation. Recovery efforts must consider continued operational requirements. Planning and protective measures would be required to ensure worker safety and prevent spread of contamination during recovery operations.	<b>10</b>	

**Table A-26. REDOX Sand Filter Scoring Basis.**

<b>REDOX SAND FILTER</b>		<b>GROUP</b>	<b>O2</b>
<b>PROBABILITY OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
1-A. Construction Type/Material is Prone to Failure	Failure due to construction type/materials is unlikely. Structure is made of reinforced concrete, 85 ft long by 20 ft wide. The roof has been repaired and is in good condition.	<b>3</b>	
1-B. Construction Similar to Other Structures that have Failed	Similar structures have not failed, but not many similar structures considered.	<b>3</b>	
1-C. Waste Stream Chemistry	Waste stream chemistry was diluted. Facility ventilation air flow.	<b>2</b>	
<b>CONSEQUENCE OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
2-A. Failing into a Safe Configuration	No soil overburden. Failure will result in open breach of the filter structure.	<b>10</b>	
2-B. Amount/Type of Material that Could be Released	Some material inventory. 5-kg plutonium.	<b>6</b>	
2-C. Proximity to Workers	Proximity to workers is approximately 230 ft from 222-S Lab.	<b>6</b>	
2-D. Extent of Recovery Effort	Recovery efforts expected to be extensive. The filter is active and in service, required to support continued operation of the facility ventilation system. Failure would have immediate impact on system operation. Recovery efforts must consider continued operational requirements. Planning and protective measures would be required to ensure worker safety and prevent spread of contamination during recovery operations.	<b>10</b>	

**Table A-27. 241-CX-70 Tank Scoring Basis.**

<b>241-CX-70 TANK</b>		<b>GROUP</b>	<b>O3</b>
<b>PROBABILITY OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
1-A. Construction Type/Material is Prone to Failure	Construction type is highly prone to failure. Several cave-ins have already occurred.	<b>8</b>	
1-B. Construction Similar to Other Structures that have Failed	No similar structures so this structure is scored mid-range <sup>1</sup> .	<b>5</b>	
1-C. Waste Stream Chemistry	Waste stream chemistry was benign.	<b>1</b>	
<b>CONSEQUENCE OF FAILURE</b>			
<b>CRITERIA</b>	<b>BASIS</b>	<b>SCORE</b>	
2-A. Failing into a Safe Configuration	Soil overburden is slightly less than structure height. Failure may result in open breach of the tank <sup>2</sup> . Tank height is 15 ft with 11-ft of soil overburden.	<b>6</b>	
2-B. Amount/Type of Material that Could be Released	No material inventory. Remaining waste was removed, the tank was dried and is considered empty.	<b>1</b>	
2-C. Proximity to Workers	Proximity to workers is approximately 580 ft from mobile offices.	<b>4</b>	
2-D. Extent of Recovery Effort	Recovery efforts expected to be moderate. Planning and protective measures would be required to ensure worker safety and prevent spread of contamination during recovery operations.	<b>5</b>	

<sup>1</sup>. There have been previous cave-ins at this site in 2004, 2016, and 2017, which have been backfilled.

<sup>2</sup>. Structures that have already subsided or caved in have been scored as if they have not yet failed. The extent of the cave-in is unknown and there is continued risk of additional cave-ins; therefore, these structures may still be considered for further evaluation.