

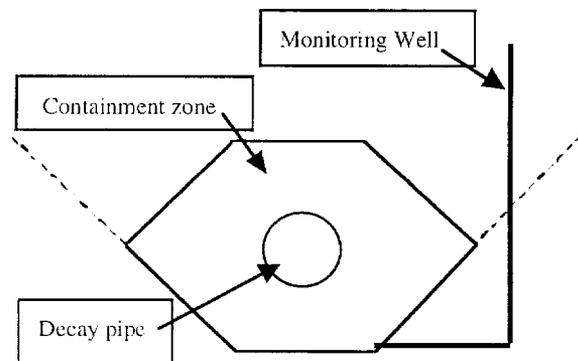


MiniBooNE Liner Integrity Study

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The civil construction for the MiniBooNE project includes a 50-m decay path and beam absorbers. The decay path is a six-foot diameter corrugated metal pipe (CMP). To prevent activation of the groundwater, the CMP and beam absorbers are surrounded by crushed aggregate, and enclosed in a double-walled geotextile membrane, referred to as the “liner”. The minimum distance from the beam centerline to the liner is 10’. The double-wall construction of the liner forms three regions, the containment volume, the interstitial volume, and the exterior. Each of these volumes is connected to monitoring wells at both the upstream and downstream ends of the decay volume, i.e. a total of six monitoring pipes extend to the surface. To confirm the integrity of the liner system following its placement, the firm Earth Tech¹ was contracted to perform tests. Michael Williams was our primary contact with Earth Tech. The following is the report from Earth Tech, with minor changes in the interest of clarity. A sketch of the decay region is shown below; only one of the layers of the liner is shown, and only one monitoring port. At the time of these tests, the excavation in general, but particularly in the vicinity of the monitoring wells had not been backfilled to the final grade, as indicated by the dashed lines.



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The report submitted by EarthTech goes into considerable detail regarding the tests and how they were conducted. In summary, the tests did not show any signs of leaks in the liner. However, EarthTech was not able to raise the level of dyed water up to the top of the liner. There are three ways that that could happen. First, there could be a leak, in which case dye would have been detected in the other monitoring wells. Second, the impedance of the system may have been too high, so that as more water was injected, the water would back up in the stand pipe: we are told this was not the case. That leaves only the third possibility, namely that the source of water basically ran out. Since the source of the water being injected was the monitoring well outside the liners, it could be that that volume was simply de-watered. In follow-up communications with EarthTech, they commented on the “slow pumping” during this process. The data also support this. The water level in the exterior zone is leveling out at the same levels obtained during the initial pump-downs. Another point is the status of the backfilling. The next paragraph discusses the full installation sequence for the liner. During the tests, the lower parts of the liner were of course supported by the underlying soils, and compressed by the aggregate inside the liner region. The upper portion was largely uncovered, as shown in the figure above. Thus, as the water level rises to the point at which the liner is folded back over to form the top, there is nothing other than the tension of the liner to prevent the interstitial region from ballooning out. If this is the case, then it would take a very large volume of water to fill the interstitial volume to the top.

In evaluating the adequacy of these tests, a further point needs to be made, and that is the time sequence of the installation of the liner. The liner was installed by Geo-Synthetics, Inc., a subcontractor to the general contractor. Due to problems with general contractor performance, some of which related to the liner installation, the first general contractor was terminated at the end of 2000, and a new contractor completed the construction. The bottom and lower sides of the liner system were placed by the first contractor, mainly during the third calendar quarter of 2000. The placement of the liner, and the other elements of work that are inside the liner, required extensive manpower, equipment and time working inside the liner region. The liner region then was left open for about five months through the winter. We believe that the nature and duration of the work and the winter exposure required that we test the integrity of the liner. In June of 2001, the top portion of the liner was put in place. Some of this work involved material that was left open during the winter, but the installation allowed full inspection of all of that material and repair of any holes. (The method of placement of all parts of the liner led by necessity to holes and seams, which are patched or joined by thermally welding the HDPE material.) Once complete, the liner tests were done within a few weeks, during which time only a small part of the area was backfilled and no other work was required in the area. The top parts of the liner were covered over with backfill within two weeks

following the tests, expect for the downstream end where more equipment is yet to be installed. While it would have given even more confidence had the tests also been able to certify the top part of the liner, we view it as being much less critical due to the top not having been exposed to nearly the same hazards as the bottom was. A full test will be done once the remaining work is completed.

Attached to the report are tables containing the measurements, and there are graphs which display the water levels during the tests. While the data are from the tests, the graphs were generated by one of us (PM), not by EarthTech. For better visualization and for ease of compatibility with Microsoft EXCEL, the water levels have been converted to negative numbers for plotting.

Mini-BooNE Target Hall 8 / GeV Beamline Project

Liner System Testing

EarthTech Engineering and Environmental Services

Oak Brook, Illinois

Project Background and Scope of Work:

In conjunction with the construction of Mini-BooNE Target Hall 8 / GeV Beamline Project (Mini-BooNE Decay Region), two layers of Geomembrane liner were placed around the zone that will contain the beamline and its surrounding containment zone. The purpose of the study performed by Earth Tech was to verify the effectiveness of this Decay Region Liner System. This was accomplished by introducing dyed water into the interstitial zone between the two liners and monitoring the areas on each side of the liners to see if any of the dyed water was getting through either of the two liners.

Description of Activities:

Monday June 25, 2001:

Earth Tech representatives arrived on site to begin setting up access to the monitoring wells. After completing the required on site safety orientation and reviewing and signing the hazard assessment plan for the project, the process of establishing access to the wells began. A lift truck was brought on site to provide the necessary access to the tops of the monitoring wells. After arriving on site, the rented lift truck was found to be without the required safety harness and could not be used until the proper harness was obtained. In the meantime, it was possible to access the 3 monitoring wells located on the southeast end of the Decay Region Liner System for water level monitoring without the use of the lift truck. It would not be possible to place the pump down these wells to dewater without the lift truck, but it was possible to put a water level indicator down the wells and check water levels. Initial checks on the water levels in the three wells showed that the water appeared to be at roughly the same level in each of the three wells. Initially, this raised concerns; if any hydraulic connection existed between the three wells, but in a location outside the containment area, due to cracks or leaks in the pipe or fittings, the chosen method of liner verification would not work. Once pumping began in one of the zones, it would become apparent whether or not the wells were somehow hydraulically connected. Later on Monday, the pump was placed in the southeast interstitial monitoring well. Once started, the pump only ran for a couple of minutes due to the large amount of sediments present in the water. The pump was a 2" Grundfos Redi-Flo pump which is not designed to handle large amounts of solids or debris. Other types of pumps

that would be able to handle larger amounts of solids and debris would not fit down the 6" wells that were constructed and available for access. The pump had to be dismantled and cleaned out prior to restarting. Activities were concluded on Monday June 25 without being able to make significant progress towards dewatering the zones. Water levels had been taken at 3 of the 6 wells and it was apparent that the pump would have to be placed in a way to avoid taking in too much silt and sediment.

Tuesday June 26, 2001:

At the beginning of the day on Tuesday, proper safety harnesses were available and the lift truck was put into use. The pump was again placed in the southeast interstitial zone well. However, this time it was not placed all the way to the bottom of the well sump but was instead left approximately 1 foot off the bottom. This allowed for the pump to operate outside of the silt and sediment. After approximately 3.5 hours, the water level in the interstitial zone well had dropped to the point where the pump could no longer continue to freely operate. It is estimated that approximately 1,900 gallons were removed during that time. By checking the water levels in the adjacent containment area well and exterior area well, it became apparent that there were no hydraulic connections between the wells. The levels in the two outside wells remained constant as the interstitial level dropped. The pump was then used to lower the water in the containment zone. It took approximately 1.5 hours to get the containment zone down to the point of no further pumping. Approximately 800 gallons were removed. Next the pump was placed into the exterior zone monitoring well. As pumping progressed in this well, the level seemed to take longer to drop; this field observation is confirmed by the data in Table 1. This was most likely due to the presence of more liquid in the unconfined region monitored by the exterior well. Pumping continued in the exterior well for 3 hours. Although the well was never completely evacuated, enough water was removed to allow migration of dyed water from the interstitial zone if a hydraulic connection were to exist.

Wednesday June 27, 2001 (a.m.):

Access was established to the 3 wells located at the northwest end of the project. It appeared from initial water level readings and rough calculations that the pumping of the three wells at the other end the previous day had some influence on these wells. The wells had different levels in them and appeared to be lower than what was initially observed in the three southeast wells. Wednesday morning was spent dewatering these three wells in similar fashion to the previous day's efforts.

Wednesday June 27, 2001 (p.m.):

At approximately 3:00 on Wednesday afternoon, the pump was used to take water from the southeast exterior zone well and interject it, along with dye, into the southeast

interstitial zone well. It is estimated that approximately 2,000 gallons were introduced during the 3.5 hours that the pump ran. The head on the interstitial zone well was brought to a level just over the point where the Geomembrane liners begin to fold in over the top of the containment zone. Continuous monitoring of the levels in the exterior and containment zone wells showed no signs of dye during Wednesday afternoon.

Thursday June 28, 2001:

In similar fashion to the southeast wells, water from the northwest exterior zone well was pumped into the northwest interstitial zone well as dye was introduced. At this end, the interstitial zone was filled with approximately 2,500 gallons of dyed water and again the head was brought to a level higher than the break point where the Geomembrane turns over the top of the containment zone. Continuous checking of both the southeast and northwest exterior and containment zone wells throughout the day on Thursday showed no signs of the dyed water from the interstitial zone.

Friday June 29, 2001:

The exterior and containment area wells were checked for the presence of dyed water throughout the morning on Friday. Again, no sign of the dyed water from the interstitial zone was found. At approximately 11:30 a.m., the pump was used to begin removing the dyed water from the northwest interstitial zone well and pump it into the water truck provided by Whittaker Excavating. The dyed water was pumped to the truck for approximately 3.5 hours or until 3:00 p.m. Although some slight trace of dye was still present when pumping stopped, most of the dyed water was removed. After having the water truck moved down to the southeast end, the dyed water was pumped from the southeast interstitial zone well for a short time. It was then decided not to remove that dyed water for the time being with the intention of coming back on Saturday and trying to place as much head on the interstitial zone as possible.

Saturday June 30, 2001:

Water from the southeast exterior zone well was again pumped into the southeast interstitial zone well. With the water that was already present in the southeast interstitial zone well, it was possible to raise the head higher than originally achieved, but the level seemed to stagnate at a point still lower than the top of the Geomembrane liner. Checking of the exterior and containment zone wells again showed no traces of the dyed water. The bulk of the dyed water was then pumped into the truck. Again, traces of dye were still visible when pumping stopped, but it was not possible to completely dewater the well with the pump being used.

Conclusion:

It appears that the Decay Region Liner System is effective and serving its purpose. At no time during the testing did any trace of the dyed water in the interstitial zone appear in any of the other zone's wells. The water levels observed during the pumping out of the residual water prior to introducing the dye also seem to indicate no hydraulic connection between the zones. While it was not possible to get the head on the dyed water in the interstitial zone higher than the top of the Geomembrane, it was possible to get the head higher than the break point where the Geomembrane overlaps the top of the containment zone.

Visual inspections of the seams of the Geomembrane on top of the containment zone also lead Earth Tech to believe that the the Geomembrane was placed with the same type expertise and quality that we have seen from GSI in the past.

One other important factor that will lead to efficient containment is the surrounding geology. The surrounding clay material is very impervious and is not allowing significant amounts of outside groundwater to enter the excavation. In similar fashion, this clay, once placed back into the excavation area, will serve to further reduce the likelihood of water moving into or out of the area in the future.

Monitoring Charts

On the following pages are the charts that show the levels in the wells as they were monitored. As explained in the above narrative, it was not always possible to fully evacuate liquid from each zone, but enough was removed to allow any dyed water from the interstitial zone to move through any possible leaks and be detected in the other two zones.

Notes to keep in mind when reviewing the charts:

1. Depths are from the top of the well pipe.
2. An indication of clear color means that no dyed water was identified. At times, the water was clear, but actually murky. Since this had no bearing on the study at hand, it was left as clear.
3. A dash in any box indicates that a reading was not taken for that well at that time.
4. A Comments/Actions column was added to show roughly when each activity began and ended.

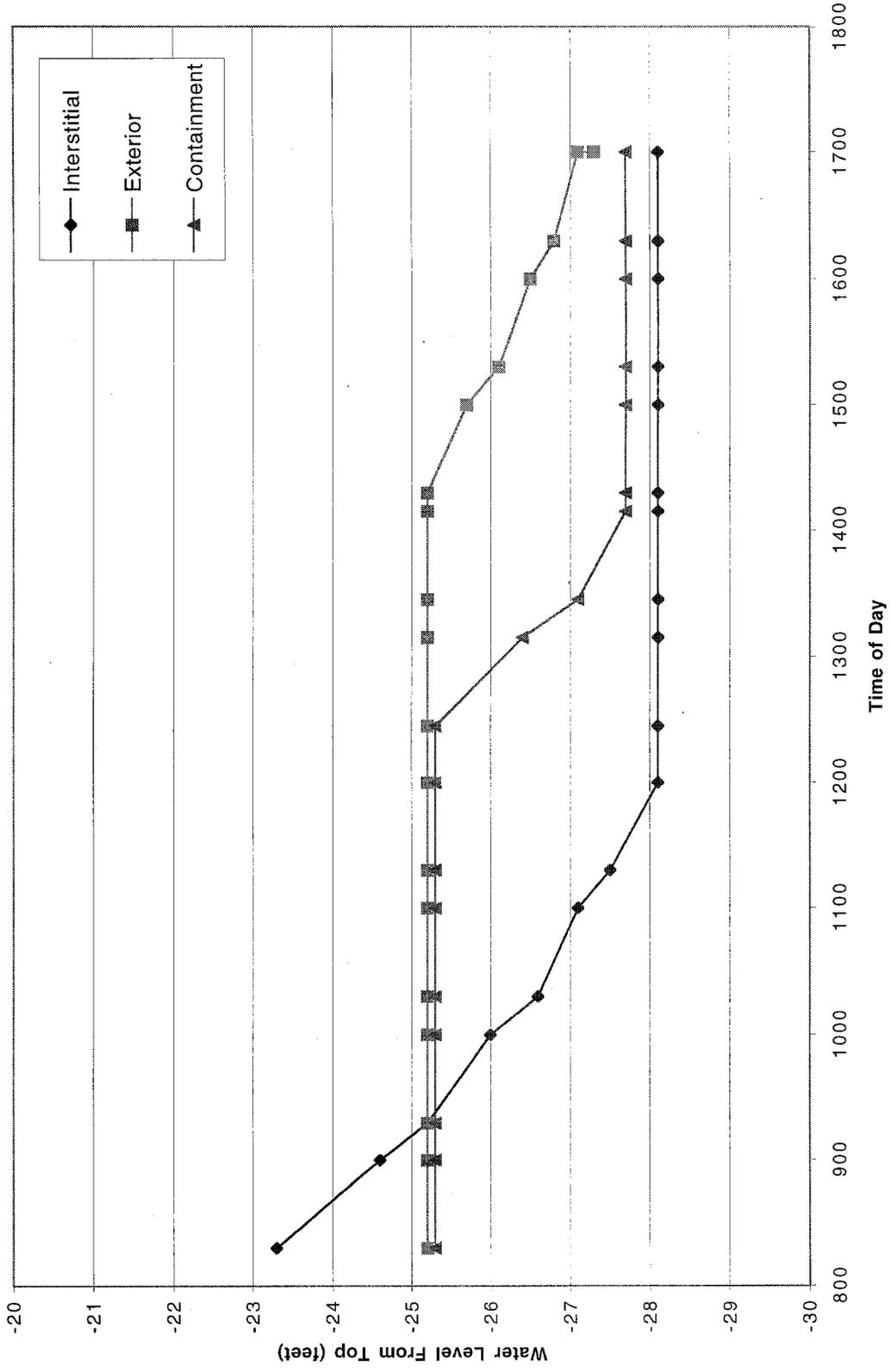
Mini-Boone Target Hall 8/GeV Beamline Project
Liner System Testing

Dates of Monitoring: Monday, June 25, 2001 and Tuesday, June 26, 2001

Date	Time	Depth to Liquid in Interstitial NW Wells				Northwest Wells				Southeast Wells				Comments / Actions		
		SE Wells		NW Wells		Liquid Present in Ext. Containment Zone?		Depth to bottom = 29		Liquid Present in Ext. Containment Zone?		Depth to bottom = 29				
		No	Yes	Color	Depth	No	Yes	Color	Depth	No	Yes	Color	Depth			
6/25/01	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6/26/01	830	-	-	-23.3	-	-	-	-	-	-	-	-	-	-	-	-
6/26/01	900	-	-	-23.3	-	-	-	-	-	-	-	-	-	-	-	-
6/26/01	930	-	-	-24.6	-	-	-	-	-	-	-	-	-	-	-	-
6/26/01	1000	-	-	-25.2	-	-	-	-	-	-	-	-	-	-	-	-
6/26/01	1030	-	-	-26.0	-	-	-	-	-	-	-	-	-	-	-	-
6/26/01	1100	-	-	-26.6	-	-	-	-	-	-	-	-	-	-	-	-
6/26/01	1130	-	-	-27.1	-	-	-	-	-	-	-	-	-	-	-	-
6/26/01	1200	-	-	-27.5	-	-	-	-	-	-	-	-	-	-	-	-
6/26/01	1245	-	-	-28.1	-	-	-	-	-	-	-	-	-	-	-	-
6/26/01	1315	-	-	-28.1	-	-	-	-	-	-	-	-	-	-	-	-
6/26/01	1345	-	-	-28.1	-	-	-	-	-	-	-	-	-	-	-	-
6/26/01	1415	-	-	-28.1	-	-	-	-	-	-	-	-	-	-	-	-
6/26/01	1430	-	-	-28.1	-	-	-	-	-	-	-	-	-	-	-	-
6/26/01	1500	-	-	-28.1	-	-	-	-	-	-	-	-	-	-	-	-
6/26/01	1530	-	-	-28.1	-	-	-	-	-	-	-	-	-	-	-	-
6/26/01	1600	-	-	-28.1	-	-	-	-	-	-	-	-	-	-	-	-
6/26/01	1630	-	-	-28.1	-	-	-	-	-	-	-	-	-	-	-	-
6/26/01	1700	-	-	-28.1	-	-	-	-	-	-	-	-	-	-	-	-
6/26/01	1700	-	-	-28.1	-	-	-	-	-	-	-	-	-	-	-	-

Notes: -Depths are from top of pipe.
- Clear color indicates no dyed water present. Water may have been murky at times.

Measurements on June 26, 2001



Mini-BoONE Target Hall 8/GeV Beamline Project
Liner System Testing

Dates of Monitoring: Wednesday, June 27, 2001

Date	Time	Depth to Liquid in Interstitial NW Wells				Liquid Present in Ext Containment Zone?				Northwest Wells				Southeast Wells				Comments / Actions	
		SE Wells		NW Wells		Depth to bottom = 29		Depth to bottom = 29		Depth to bottom = 29		Depth to bottom = 29		Depth to bottom = 29		Depth to bottom = 29			
		No	Yes	No	Yes	Color	Depth	No	Yes	Color	Depth	No	Yes	Color	Depth	No	Yes		Color
6/27/01	800	-	x	clear	-26.7	x	clear	-26	x	clear	26.6	x	clear	27.7					Begin NW Inter. Well pumping
6/27/01	830	-	x	clear	-26.7	x	clear	-26											
6/27/01	900	-	x	clear	-26.7	x	clear	-26											
6/27/01	930	-	x	clear	-26.7	x	clear	-26											
6/27/01	1000	-	x	clear	-26.7	x	clear	-26											
6/27/01	1015	-	x	clear	-26.7	x	clear	-26											
6/27/01	1045	-	x	clear	-26.7	x	clear	-26.8											
6/27/01	1115	-	x	clear	-26.7	x	clear	-27.5											
6/27/01	1145	-	x	clear	-26.7	x	clear	-27.8											End NW Cont. Well pumping
6/27/01	1230	-	x	clear	-26.7	x	clear	-27.8											Begin NW Cont. Well pumping
6/27/01	1300	-	x	clear	-27.1	x	clear	-27.8											
6/27/01	1330	-	x	clear	-27.4	x	clear	-27.8											
6/27/01	1400	-	x	clear	-27.7	x	clear	-27.8											End NW Ext. Well pumping
6/27/01	1430	-	-	-	-	-	-	-											Begin Dye into SE Inter. Well
6/27/01	1500	-	-	-	-	-	-	-											
6/27/01	1530	-	-	-	-	-	-	-											
6/27/01	1600	-	-	-	-	-	-	-											
6/27/01	1630	-	-	-	-	-	-	-											
6/27/01	1700	-	-	-	-	-	-	-											
6/27/01	1730	-	-	-	-	-	-	-											End Dye into SE Inter. Well
6/27/01	1800	-	-	-	-	-	-	-											

Notes: -Depths are from top of pipe.

- Clear color indicates no dyed water present. Water may have been murky at times.

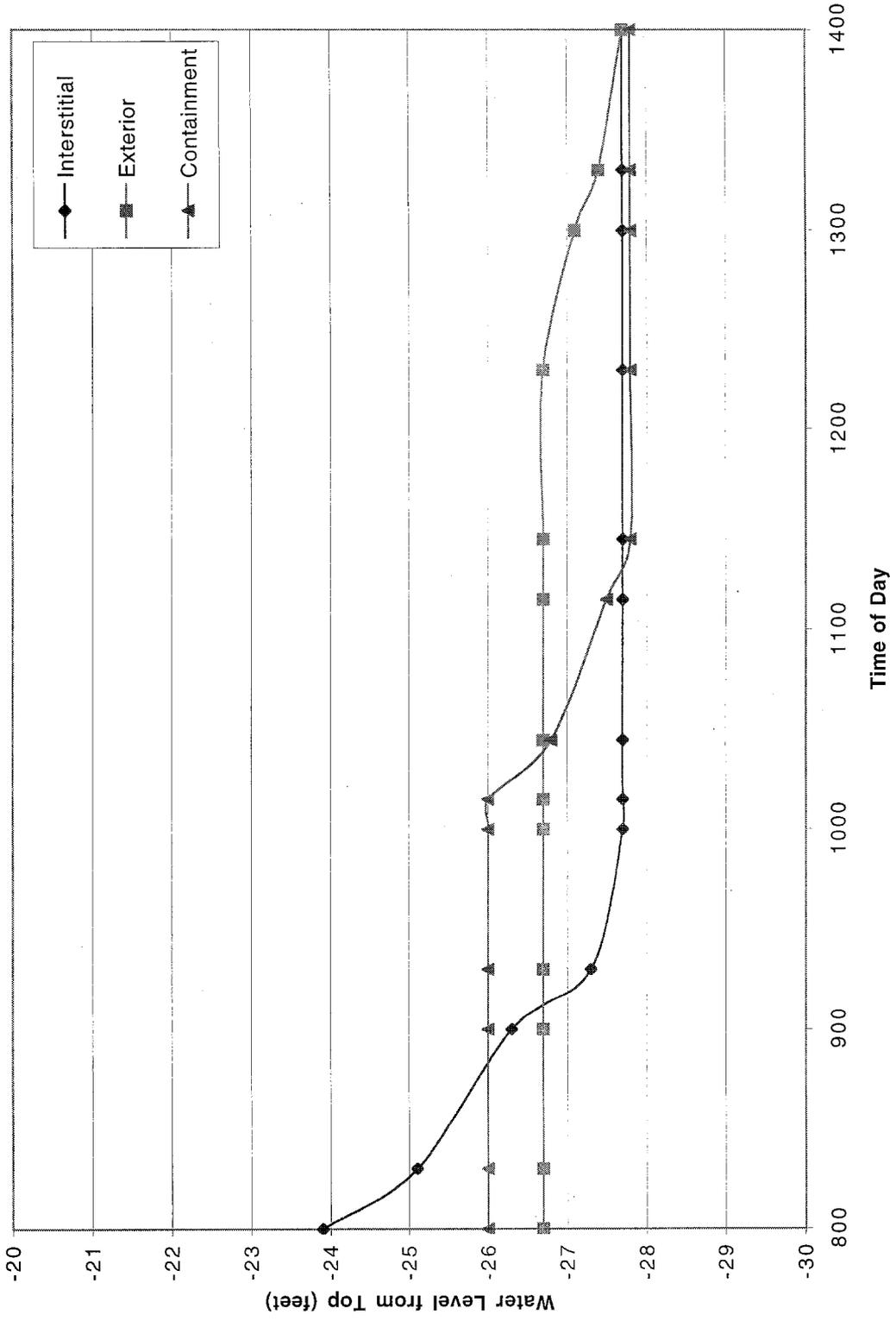
Mini-Boone Target Hall 8/GeV Beamline Project
Liner System Testing

Dates of Monitoring: Wednesday, June 27, 2001

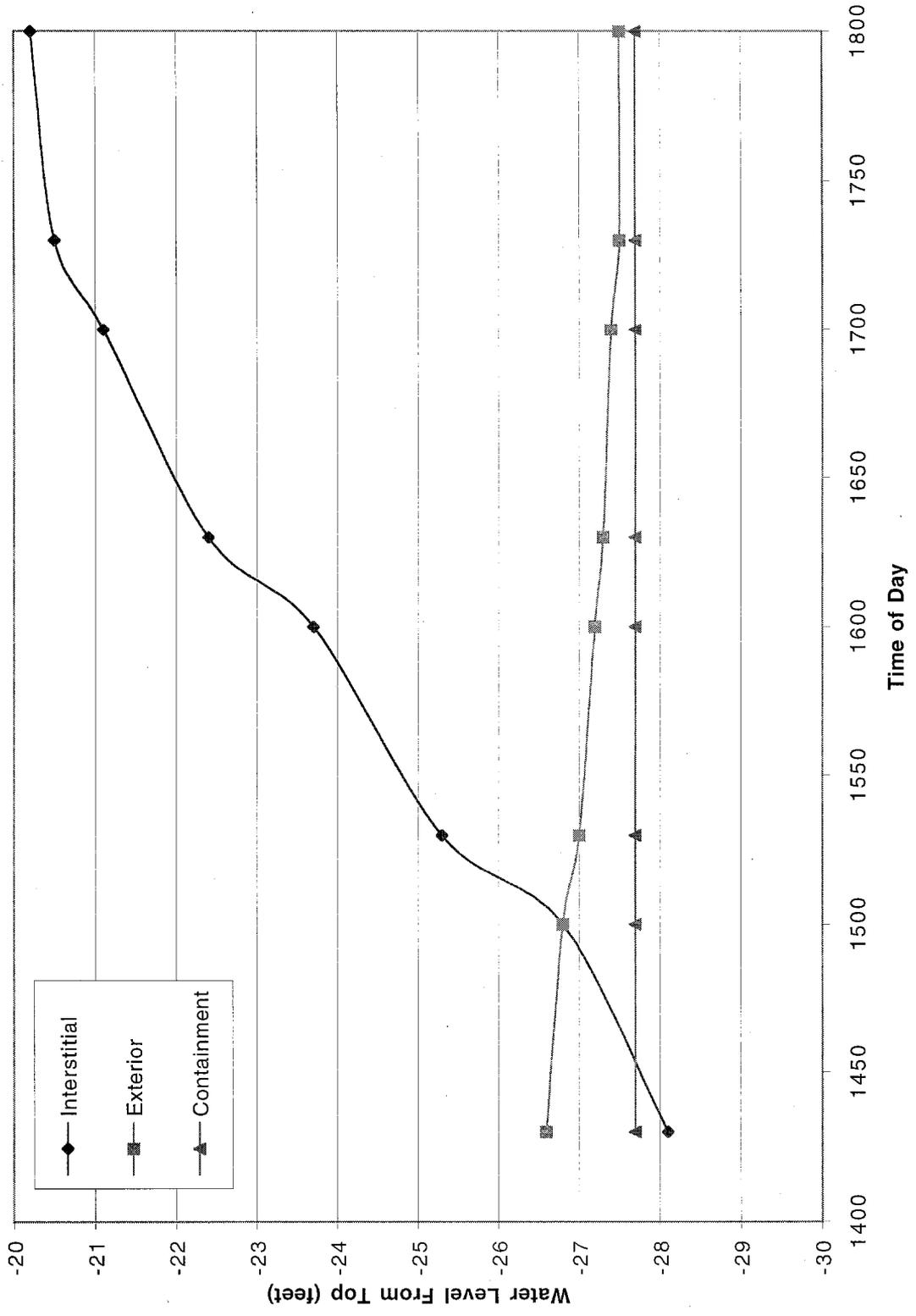
Date	Time	Depth to Liquid in Interstitial		Northwest Wells						Southeast Wells						Comments / Actions
		NW Wells	SE Wells	Liquid Present in Ex Containment Zone?		Liquid Present in Ex Containment Zone?		Liquid Present in Ex Containment Zone?		Liquid Present in Ex Containment Zone?		Liquid Present in Ex Containment Zone?		Liquid Present in Ex Containment Zone?		
				No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	
6/27/01	800	23.9	-	x	clear	26.7	x	clear	26.0	x	clear	26.6	x	clear	27.7	Begin NW Inter. Well pumping
6/27/01	830	25.1	-	x	clear	26.7	x	clear	26.0	-	-	-	-	-	-	
6/27/01	900	26.3	-	x	clear	26.7	x	clear	26.0	-	-	-	-	-	-	
6/27/01	930	27.3	-	x	clear	26.7	x	clear	26.0	-	-	-	-	-	-	
6/27/01	1000	27.7	-	x	clear	26.7	x	clear	26.0	-	-	-	-	-	-	End NW Inter. Well pumping
6/27/01	1015	27.7	-	x	clear	26.7	x	clear	26.0	-	-	-	-	-	-	Begin NW Cont. Well pumping
6/27/01	1045	27.7	-	x	clear	26.7	x	clear	26.8	-	-	-	-	-	-	
6/27/01	1115	27.7	-	x	clear	26.7	x	clear	27.5	-	-	-	-	-	-	
6/27/01	1145	27.7	-	x	clear	26.7	x	clear	27.8	-	-	-	-	-	-	End NW Cont. Well pumping
6/27/01	1230	27.7	-	x	clear	26.7	x	clear	27.8	-	-	-	-	-	-	Begin NW Ext. Well pumping
6/27/01	1300	27.7	-	x	clear	27.1	x	clear	27.8	-	-	-	-	-	-	
6/27/01	1330	27.7	-	x	clear	27.4	x	clear	27.8	-	-	-	-	-	-	
6/27/01	1400	27.7	-	x	clear	27.7	x	clear	27.8	-	-	-	-	-	-	End NW Ext. Well pumping
6/27/01	1430	-	28.1	-	-	-	-	-	-	-	-	-	-	-	-	Begin Dye into SE Inter.
6/27/01	1500	-	26.8	-	-	-	-	-	-	-	-	-	-	-	-	
6/27/01	1530	-	25.3	-	-	-	-	-	-	-	-	-	-	-	-	
6/27/01	1600	-	23.7	-	-	-	-	-	-	-	-	-	-	-	-	
6/27/01	1630	-	22.4	-	-	-	-	-	-	-	-	-	-	-	-	
6/27/01	1700	-	21.1	-	-	-	-	-	-	-	-	-	-	-	-	
6/27/01	1730	-	20.5	-	-	-	-	-	-	-	-	-	-	-	-	
6/27/01	1800	-	20.2	-	-	-	-	-	-	-	-	-	-	-	-	End Dye into SE Inter.

Notes: -Depths are from top of pipe.
- Clear color indicates no dyed water present. Water may have been murky at times.

Measurements on June 27, 2001 (1)



Measurements on June 27, 2001 (2)



Mini-BoONE Target Hall 8/GeV Beamline Project
Liner System Testing

Dates of Monitoring: Thursday, June 28, 2001

Date	Time	Depth to Liquid in Interstitial NW Wells		Northwest Wells						Southeast Wells						Comments / Actions	
		27.7	20.2	Liquid Present in Zone?		Depth to bottom = 29		Liquid Present in Zone?		Depth to bottom = 29		Liquid Present in Zone?		Depth to bottom = 29			
				No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes		No
6/28/01	800	27.7	20.2	x	clear	26.9	27.8	x	clear	27.8	x	clear	27.1	x	clear	27.7	Begin Dye into NW Inter. Well
6/28/01	830	25.9	-	x	clear	27.1	27.8	x	clear	27.8	-	-	-	-	-	-	
6/28/01	900	24.6	-	x	clear	27.3	27.8	x	clear	27.8	-	-	-	-	-	-	
6/28/01	930	23.1	-	x	clear	27.6	27.8	x	clear	27.8	-	-	-	-	-	-	
6/28/01	1000	21.8	-	x	clear	27.7	27.8	x	clear	27.8	-	-	-	-	-	-	
6/28/01	1030	20.7	-	x	clear	27.8	27.8	x	clear	27.8	-	-	-	-	-	-	
6/28/01	1100	20.1	-	x	clear	27.9	27.8	x	clear	27.8	-	-	-	-	-	-	End Dye into NW Inter. Well
6/28/01	1115	20.1	20.2	x	clear	27.9	27.8	x	clear	27.8	x	clear	27.0	x	clear	27.7	Begin visual mon. of ext. ank
6/28/01	1200	20.1	20.2	x	clear	27.9	27.8	x	clear	27.8	-	-	-	-	-	-	
6/28/01	1230	20.1	20.2	x	clear	27.9	27.8	x	clear	27.8	x	clear	27.0	x	clear	27.7	
6/28/01	1300	20.1	20.2	x	clear	27.7	27.8	x	clear	27.8	x	clear	26.9	x	clear	27.7	
6/28/01	1330	20.1	20.2	x	clear	27.7	27.8	x	clear	27.8	x	clear	26.9	x	clear	27.7	
6/28/01	1400	20.1	20.2	x	clear	27.7	27.8	x	clear	27.8	x	clear	26.8	x	clear	27.7	
6/28/01	1430	20.1	20.2	x	clear	27.6	27.8	x	clear	27.8	x	clear	26.8	x	clear	27.7	
6/28/01	1500	20.1	20.2	x	clear	27.6	27.8	x	clear	27.8	x	clear	26.8	x	clear	27.7	
6/28/01	1530	20.1	20.2	x	clear	27.5	27.8	x	clear	27.8	x	clear	26.6	x	clear	27.7	
6/28/01	1600	20.1	20.2	x	clear	27.3	27.8	x	clear	27.8	x	clear	26.6	x	clear	27.7	
6/28/01	1630	20.1	20.2	x	clear	27.2	27.8	x	clear	27.8	x	clear	26.6	x	clear	27.7	

Notes: -Depths are from top of pipe.
- Clear color indicates no dyed water present. Water may have been murky at times.

Mini-Boone Target Hall 8/GeV Beamline Project
Liner System Testing

Dates of Monitoring: Friday, June 29, 2001

Date	Time	Depth to Liquid in Interstitial in NW Wells		Northwest Wells						Southeast Wells						Comments / Actions	
		20.1	20.2	Liquid Present in Zone?		Depth to bottom = 29		Liquid Present in Zone?		Depth to bottom = 29		Liquid Present in Zone?		Depth to bottom = 29			
				No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes		No
6/29/01	8:30am			x	clear	26.8	27.8	x	clear	25.7	27.7	x	clear	25.7	27.7		
6/29/01	9:00am			x	clear	26.8	27.8	x	clear	25.7	27.7	x	clear	25.7	27.7		
6/29/01	9:30am			x	clear	26.8	27.8	x	clear	25.7	27.7	x	clear	25.7	27.7		
6/29/01	10:00am			x	clear	26.8	27.8	x	clear	25.7	27.7	x	clear	25.7	27.7		
6/29/01	10:30am			x	clear	26.8	27.8	x	clear	25.7	27.7	x	clear	25.7	27.7		
6/29/01	11:00am			x	clear	26.8	27.8	x	clear	25.7	27.7	x	clear	25.7	27.7		
6/29/01	11:30am			x	clear	26.8	27.8	x	clear	25.7	27.7	x	clear	25.7	27.7		
6/29/01	12:00pm			x	clear	26.8	27.8	x	clear	25.7	27.7	x	clear	25.7	27.7		
6/29/01	12:30pm			x	clear	26.8	27.8	x	clear	25.7	27.7	x	clear	25.7	27.7		Begin NW Int. well pump out
6/29/01	1:00pm			x	clear	26.8	27.8	x	clear	25.7	27.7	x	clear	25.7	27.7		
6/29/01	1:30pm			x	clear	26.8	27.8	x	clear	25.7	27.7	x	clear	25.7	27.7		
6/29/01	2:00pm			x	clear	26.8	27.8	x	clear	25.7	27.7	x	clear	25.7	27.7		
6/29/01	2:30pm			x	clear	26.8	27.8	x	clear	25.7	27.7	x	clear	25.7	27.7		
6/29/01	3:00pm			x	clear	26.8	27.8	x	clear	25.7	27.7	x	clear	25.7	27.7		End NW Int. well pump out
6/29/01	3:30pm		20.2	-	-	-	-	-	-	25.7	27.7	x	clear	25.7	27.7		Begin SE Int. well pump out
6/29/01	4:00pm		21.1	-	-	-	-	-	-	25.7	27.7	x	clear	25.7	27.7		Temp. End SE Int. well pump out

Notes: -Depths are from top of pipe.
- Clear color indicates no dyed water present. Water may have been murky at times.

