WASTEWATER ADDENDUM
Tribal Environmental Evaluation

Jamul Indian Village
Gaming Development Project

APPENDICES

May 2015

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May 2015

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WASTEWATER ADDENDUM APPENDICES

APPENDIX 1

SITE CHARACTERIZATION REPORTS

CONSTRUCTION TESTING & ENGINEERING, INC.
1441 MONTIEL ROAD, SUITE 115 | ESCONDIDO, CA 92026 | 760.746.4955 | FAX 760.746.9806

June 3, 2014 CTE-Project No. 10-11795T

Jamul Indian Village of California
14191 Highway 94
Jamul, California 91935

C/O: Marnell Architecture
Attention: Mr. Brandon T. Moore
222 Via Marnell Way
Las Vegas, Nevada 98119
Telephone: (702)739-2000 Via Email: bmoore@marnellcompanies.com

Subject: Proposed IMP Catch Basin Evaluation of Percolation Rates
Jamul Indian Village Hollywood Casino
West Side of SR94, South of Melody Road
Jamul, California

Mr. Moore:

At your request, Construction Testing and Engineering, Inc. (CTE), has completed the requested the IMP catch basin evaluation for percolation rates at the above referenced project. A total of eleven percolation tests were performed within four proposed IMP catch basin locations, IMP basins B, C, D, and an unidentified basin located along Reservation Road. The basin locations were provided by San Dieguito Engineering, Inc., on the Hollywood Casino Loop Road Improvement Plan Sheet 8 (Figure 1), and detailed Plan sheets 13, 15, 16 and 18 (Figures 2 and 2a). The field investigation was first conducted in the two basins located west of Willow Creek, IMP B and IMP C on May 23, 2014. Three percolation tests were performed in IMP B and two within IMP C. The percolation tests locations presented on Figure 2 were based on available access to proposed basin areas.

The field investigation for IMP D and the Reservation Road proposed basin locations were conducted on May 29, 2014. Three percolation tests were completed in each of these proposed basin locations (Figure 2a).

PERCOLATION TEST METHODOLOGY, CONDITIONS, AND RESULTS

Percolation tests were conducted at locations described above with test depths at the approximate catch basins bottom elevation according to the above referenced improvement plan sheets. The geologic units encountered in the testing areas generally consisted of fill material, alluvium/colluvium/residual soil, residual soil on granitic rock, and weathered granitic rock of diorite to granodiorite composition. The fill material encountered in test hole PT-5 generally consists of loose silty sand with large angular rock. The alluvium/colluvium/residual soil generally consists of silty sand with clay and typically has fine subrounded gravel present near the base of the

unit. The residual soil that was developed on granitic rock consisted of sandy clay that graded into extremely too highly weathered fractured diorite to granodiorite granite rock. The percolation tests were conducted in general accordance with the County of San Diego guidelines. The percolation rates account for both lateral and vertical flow through the tested section.

Water used to conduct the tests was stored in a polyurethane tank. Weather conditions during the test were overcast then became sunny during both presoaking and testing days. The Percolation testing methodology was determined following the presoak period per the County guidelines. In summary, Case I conditions are determined by water remaining overnight following an initial four-hour presoak. Case II is considered a fast draining soil in which two columns of 12-14 inches of water percolate in less than 30 minutes during the second presoak period that is conducted after a minimum of 15 hours of the initial presoak period. Case III conditions result when no water remains in the test hole 15-30 hour after the initial four-hour presoak, but does not meet Case II conditions during the second presoak period. Percolation test locations PT-1, PT-2 and PT-4 met Case I requirements, test location PT-5 met Case II requirements, and test locations PT-3 and PT-6 through PT-11 met Case III conditions. The following table presents the percolation test results. The logs of the percolation test holes are presented in Appendix A.

Test Location	**Proposed IMP Basin**	**Geologic Unit (at existing surface)**	**Test Elevation (feet msl)**	**Proposed IMP Invert Elevation (feet msl)**	**Percolation Rate (min./in.)**	**(in./min)**
PT-1	B	GRw	883.6 to 883.0	886.5	240	4.2×10^{-3}
PT-2	B	GRw	885.6 to 885.0	886.5	480	2.1×10^{-3}
PT-3	B	GRw	887.1 to 886.5	886.5	96	1.0×10^{-2}
PT-4	C	GRw	884.1 to 883.5	884.5	160	6.3×10^{-3}
PT-5	C	Qudf	881.6 to 881.0	884.5	5	2.0×10^{-1}
PT-6	D	Qal/Col/RS	925.8 to 925.2	927.0	11	9.0×10^{-2}
PT-7	D	Qal/Col/RS	925.1 to 924.5	927.0	11	9.0×10^{-2}
PT-8	D	Qal/Col/RS	926.1 to 925.5	927.0	30	3.3×10^{-2}
PT-9	Reservation Road	GRw	902.6 to 902.0	TBD	9	1.1×10^{-1}
PT-10	Reservation Road	GRw	902.1 to 901.5	TBD	15	6.7×10^{-2}
PT-11	Reservation Road	GRw	902.1 to 901.5	TBD	13	7.7×10^{-2}

CONCLUSIONS

Percolation rates presented above represent the anticipated conditions of the proposed basins. However, the rate of five minutes per inch in test location PT-5 in IMP C was in loose fill material with abundant rock and void space, and likely does not represent finished grading conditions of the proposed basin. Test location PT-4 in IMP C was performed in the weathered granitic rock and is a better representation of subgrade conditions. The percolation rates in basin IMP B range from

approximately 96 to 480 minutes per inch (1.0×10^{-2} to 4.2×10^{-3} inches per minute) in weathered granitic rock. Basin IMP C is best represented by a rate of 160 minutes per inch (6.3×10^{-3} inches per minute) in weathered granitic rock. Basin IMP D rates range from approximately 11 to 30 minutes per inch (3.3×10^{-2} to 9.0×10^{-2} inches per minute) in alluvium/colluvium with pedogenic soil development, and the east end of Reservation Road rates range from approximately 9 to 15 minutes per inch (1.1×10^{-1} to 7.7×10^{-2} inches per minute) in weathered granitic rock.

In general, a decrease in the percolation rates with depth was observed in the weathered granitic rock, and therefore the rates on the order of 10^{-3} inches per minute are recommended for use in design for IMP basins B and C. For IMP basins D and Reservation Road, rates on the order of 10^{-2} inches per minute are indicated from the percolation tests. However, these rates should be anticipated to vary with depth, and the observed rates should be considered for only a few of depth in design.

LIMITATIONS

As indicated, the precision of the percolation tests are limited due to the variability in soils, both naturally and man induced, across the site, and variable conditions during testing, such as climatic conditions, liquids, and equipment used. Therefore, the recorded infiltration rates should be considered only as an index values.

We appreciate the opportunity to be of service on this project. Should you have any questions or need further information please do not hesitate to contact this office.

Respectfully submitted,

CONSTRUCTION TESTING & ENGINEERING, INC.

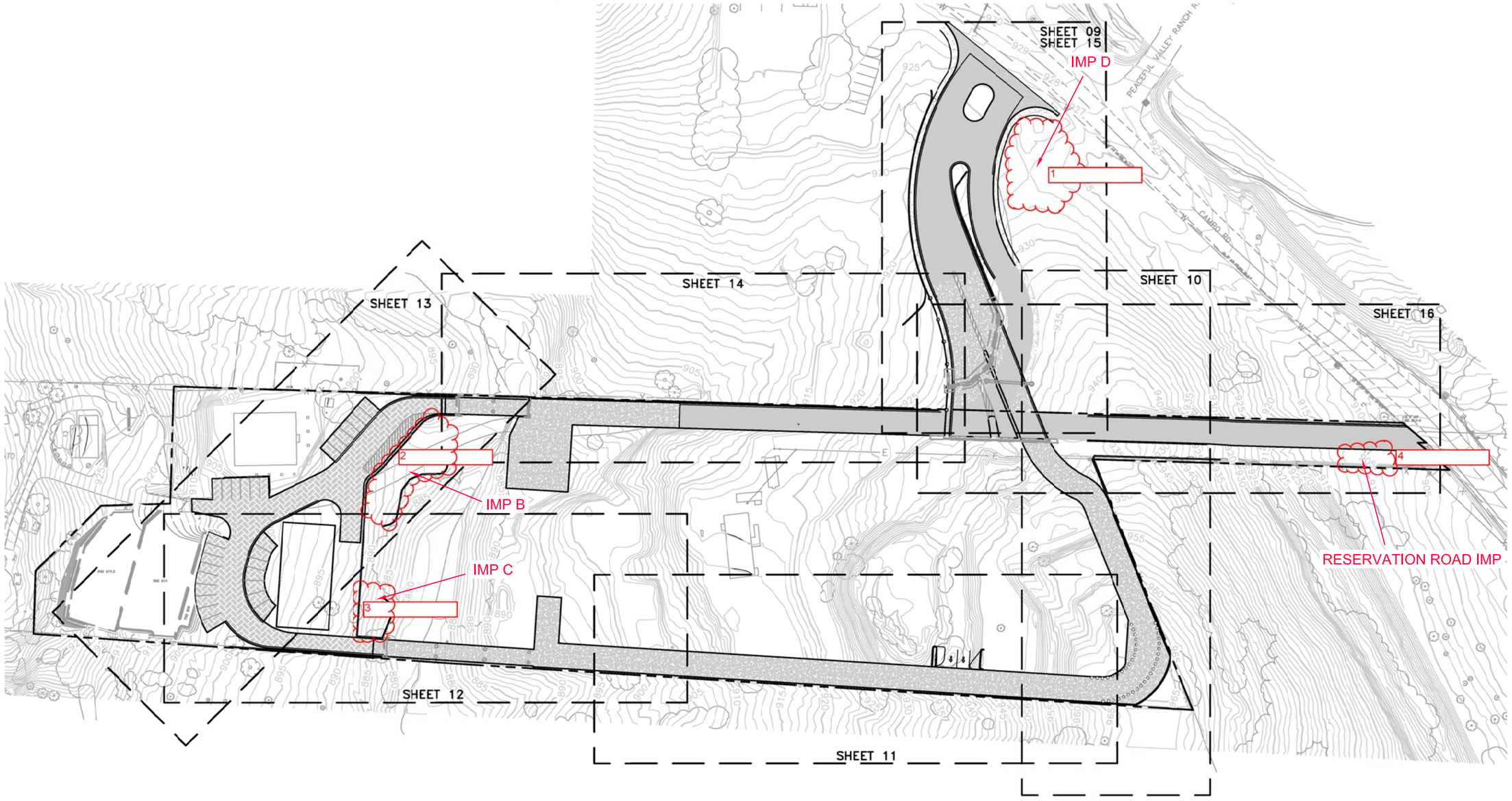
Dan T. Math, GE #2665
Principal Engineer

Martin E. Siem, CEG #2311
Senior Engineering Geologist

MCB/MES/DTM:nri

Attachment:

Figures 1	IMP Basin Locations
Figure 2 and 2a	Percolation Test Location Maps
Appendix A	Percolation Test Hole Logs



\\Esc_server\projects\10-11795T\Percolation Testing\Figure 1.dwg

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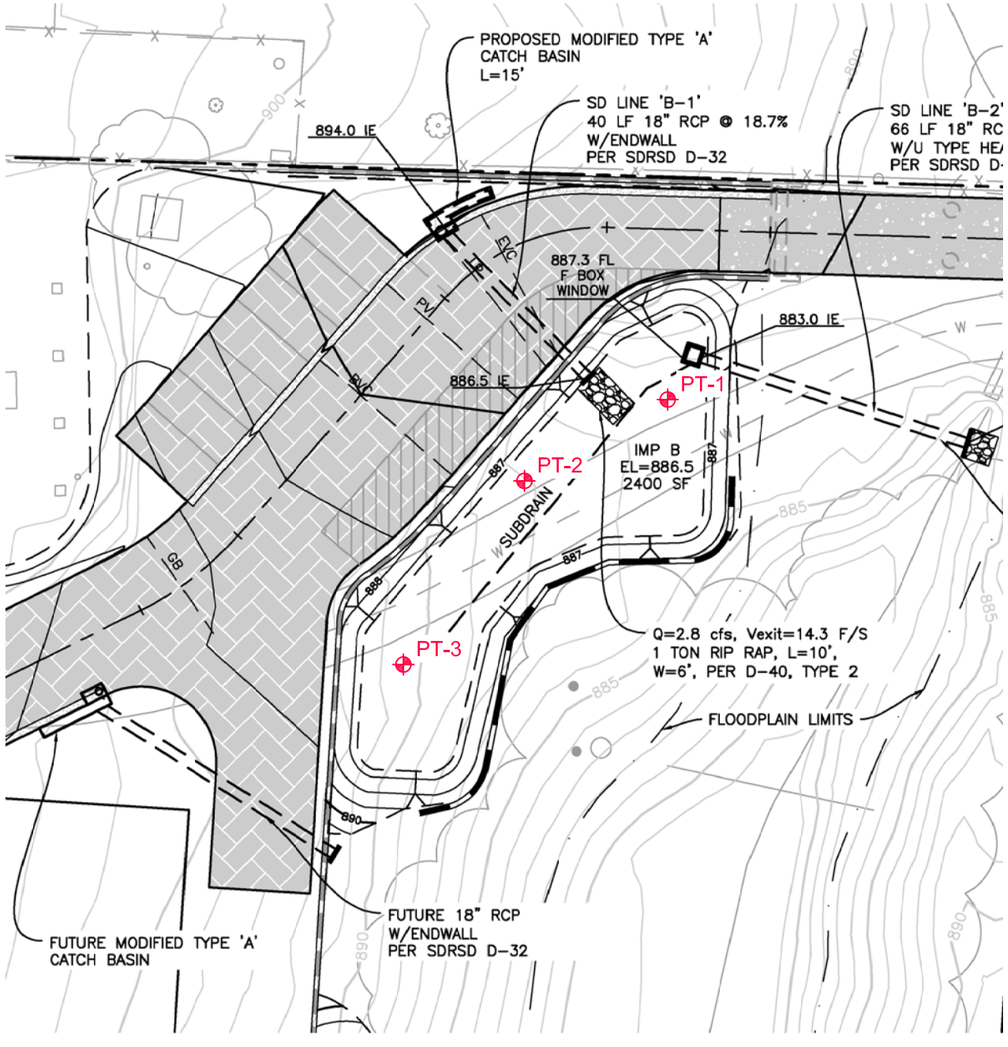
IMP BASIN LOCATION MAP

JAMUL GAMING FACILITY DEVELOPMENT
JAMUL INDIAN VILLAGE
JAMUL, CALIFORNIA

CTE JOB NO:	10-11795G
SCALE:	1" = 100'
DATE:	6/14
FIGURE:	1



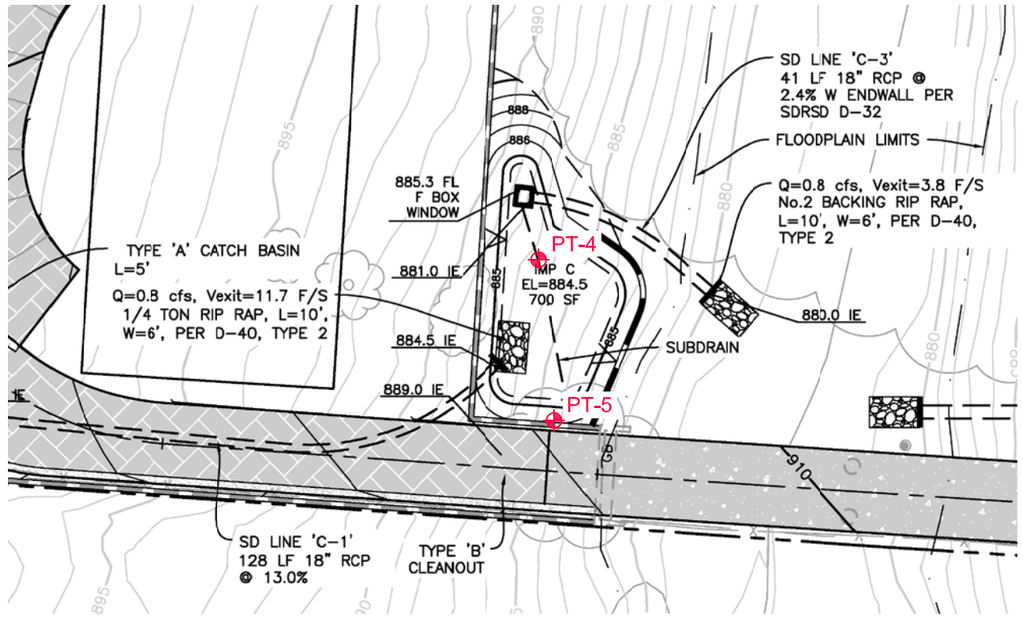
BASIN B (IMP)

LEGEND

PT-5 APPROXIMATE PERCOLATION TEST LOCATION

30 0 15' 30'

1 inch = 30 ft.



BASIN C (IMP)

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EXPLORATION LOCATION MAP (IMP B & C)
JAMUL GAMING FACILITY DEVELOPMENT
JAMUL INDIAN VILLAGE
SAN DIEGO COUNTY, CALIFORNIA

CTE JOB NO:	
10-11795G	
SCALE: 1" ~ 30'	
DATE: 5/14	FIGURE: 2

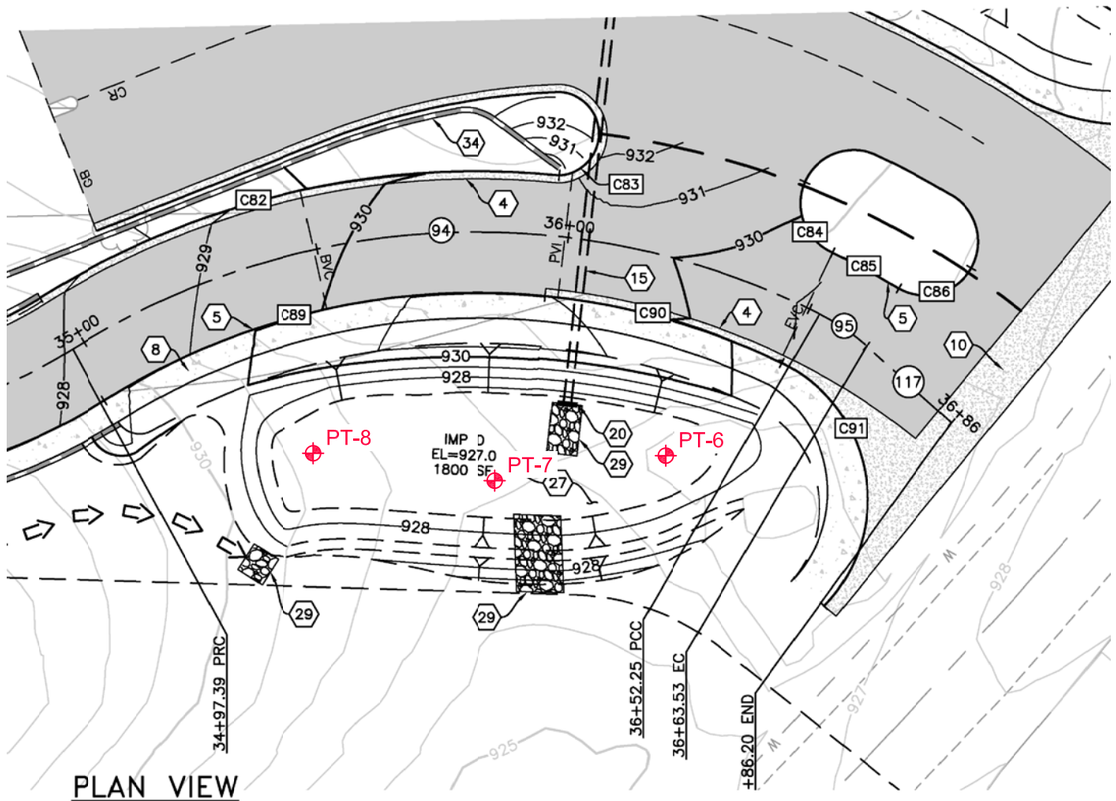
\\Esc_server\projects\10-11795T\Percolation Testing\Fig 2 and 2a (perc tests).dwg

LEGEND

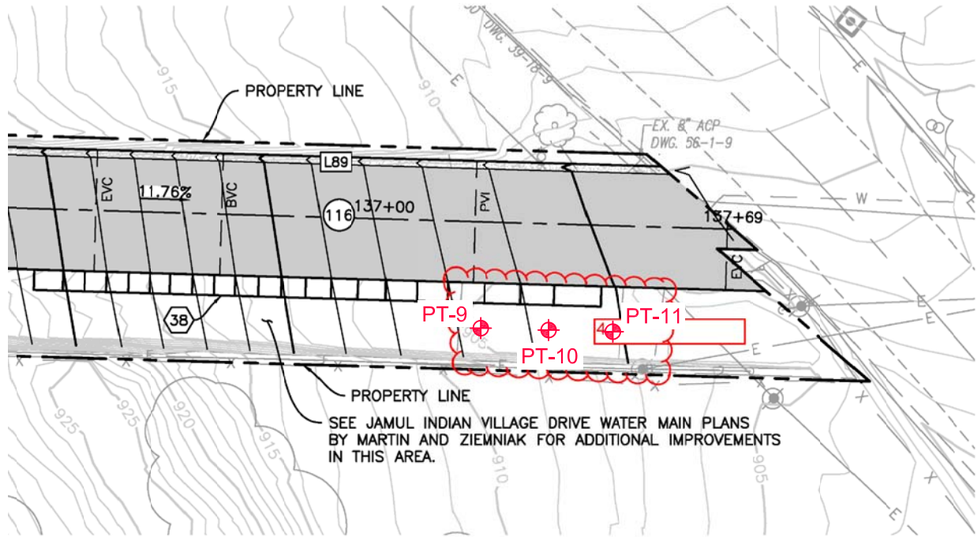
PT-11 ⊕ APPROXIMATE PERCOLATION TEST LOCATION

30 0 15’ 30’

1 inch = 30 ft.



PLAN VIEW
STA 33+10.03 TO 36+86.20



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PERCOLATION TEST LOCATION MAP
(IMP D AND RESERVATION ROAD)
JAMUL GAMING FACILITY DEVELOPMENT
JAMUL INDIAN VILLAGE
SAN DIEGO COUNTY, CALIFORNIA

CTE JOB NO:	10-11795G
SCALE:	1” ~ 30’
DATE: 5/14	FIGURE: 2a

\\Esc_server\projects\10-11795T\Percolation Testing\Fig 2 and 2a (perc tests).dwg

APPENDIX A

PERCOLATION TEST HOLE LOGS

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DEFINITION OF TERMS

PRIMARY DIVISIONS			SYMBOLS	SECONDARY DIVISIONS
COARSE GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS < 5% FINES	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES LITTLE OR NO FINES
			GP	POORLY GRADED GRAVELS OR GRAVEL SAND MIXTURES, LITTLE OF NO FINES
		GRAVELS WITH FINES	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES, NON-PLASTIC FINES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES, PLASTIC FINES
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS < 5% FINES	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			SP	POORLY GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES	SM	SILTY SANDS, SAND-SILT MIXTURES, NON-PLASTIC FINES
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES, PLASTIC FINES
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50		ML	INORGANIC SILTS, VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, SLIGHTLY PLASTIC CLAYEY SILTS
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY, SANDY, SILTS OR LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTY CLAYS
HIGHLY ORGANIC SOILS			PT	PEAT AND OTHER HIGHLY ORGANIC SOILS

GRAIN SIZES

BOULDERS	COBBLES	GRAVEL		SAND			SILTS AND CLAYS
		COARSE	FINE	COARSE	MEDIUM	FINE	

12" 3" 3/4" 4 10 40 200

CLEAR SQUARE SIEVE OPENING U.S. STANDARD SIEVE SIZE

ADDITIONAL TESTS

(OTHER THAN TEST PIT AND BORING LOG COLUMN HEADINGS)

MAX- Maximum Dry Density
GS- Grain Size Distribution
SE- Sand Equivalent
EI- Expansion Index
CHM- Sulfate and Chloride Content , pH, Resistivity
COR - Corrosivity
SD- Sample Disturbed
PM- Permeability
SG- Specific Gravity
HA- Hydrometer Analysis
AL- Atterberg Limits
RV- R-Value
CN- Consolidation
CP- Collapse Potential
HC- Hydrocollapse
REM- Remolded
PP- Pocket Penetrometer
WA- Wash Analysis
DS- Direct Shear
UC- Unconfined Compression
MD- Moisture/Density
M- Moisture
SC- Swell Compression
OI- Organic Impurities

FIGURE: BL1

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PROJECT:	DRILLER:	SHEET: of
CTE JOB NO:	DRILL METHOD:	DRILLING DATE:
LOGGED BY:	SAMPLE METHOD:	ELEVATION:

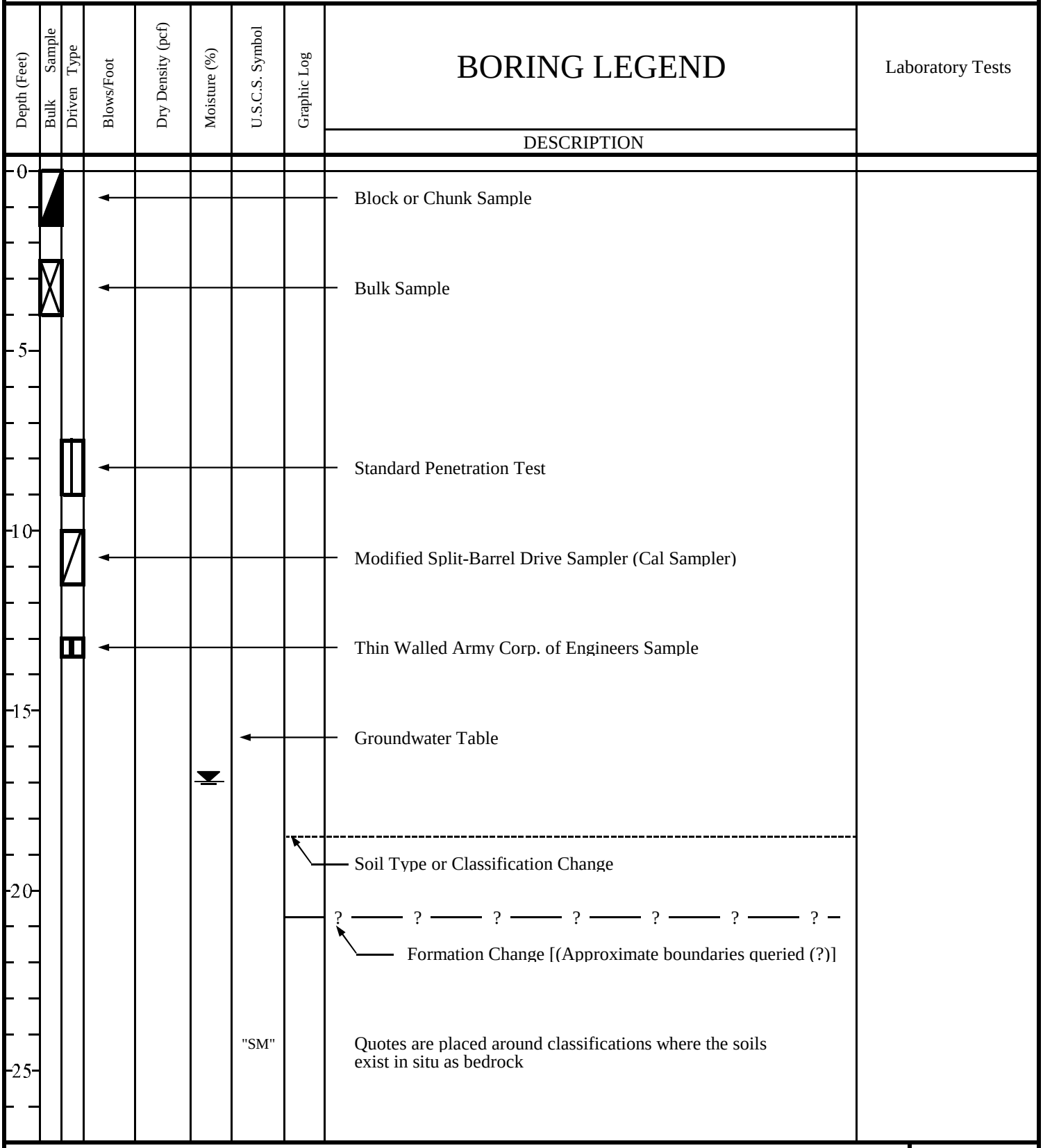

FIGURE: BL2

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1441 MONTIEL ROAD, SUITE 115 | ESCONDIDO, CA 92026 | 760.746.4955

PROJECT:	HOLLYWOOD CASINO	DRILLER:	BAJA EXPLORATION	SHEET:	1 of 1
CTE JOB NO:	10-11795T	DRILL METHOD:	HOLLOW-STEM AUGER	DRILLING DATE:	5/22/2014
LOGGED BY:	AJB	SAMPLE METHOD:	BULK, RING, AND SPT	ELEVATION:	886.5

BORING: PT-1

(IMP B)

Depth (Feet)	Elevation (feet msl)	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0	886				SC		RESIDUALSOIL (ON GRANITIC ROCK): Dense, moist, reddish brown clayey fine to medium grained SAND, oxidized.	
	883				"SM"		CRETACEOUS GRANITIC ROCK (GRw): Dense, slightly moist, gray, diorite estremely to highly weathered, excavates to fine to medium grained SAND.	
							Total Depth 3'	
5								
10								
15								
20								
25								

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PROJECT:	HOLLYWOOD CASINO	DRILLER:	BAJA EXPLORATION	SHEET:	1 of 1
CTE JOB NO:	10-11795T	DRILL METHOD:	HOLLOW-STEM AUGER	DRILLING DATE:	5/22/2014
LOGGED BY:	AJB	SAMPLE METHOD:	BULK, RING, AND SPT	ELEVATION:	888.0

BORING: PT-2

(IMP B)

Depth (Feet)	Elevation (feet msl)	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0	888				SC		RESIDUAL SOIL (ON GRANITIC ROCK): Dense, slightly moist, reddish brown clayey fine to medium grained SAND.	
					"SM"		CRETACEOUS GRANITIC ROCK (GRw): Very dense, slightly moist, gray, diorite, extremely to highly weathered, excavates to fine to medium grained SAND.	
	885						Total Depth 3'	
5								
10								
15								
20								
25								

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PROJECT:	HOLLYWOOD CASINO	DRILLER:	BAJA EXPLORATION	SHEET:	1 of 1
CTE JOB NO:	10-11795T	DRILL METHOD:	HOLLOW-STEM AUGER	DRILLING DATE:	5/22/2014
LOGGED BY:	AJB	SAMPLE METHOD:	BULK, RING, AND SPT	ELEVATION:	890.5

BORING: PT-3

(IMP B)

Depth (Feet)	Elevation (feet msl)	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0	890				SM		CRETACEOUS GRANITIC ROCK (GRw): Very dense, slightly moist, gray diorite, highly weathered, excavates to silty fine to medium grained SAND.	
	888							
	886.5							
5							Total Depth 4'	
10								
15								
20								
25								

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PROJECT:	HOLLYWOOD CASINO	DRILLER:	BAJA EXPLORATION	SHEET:	1 of 1
CTE JOB NO:	10-11795T	DRILL METHOD:	HOLLOW-STEM AUGER	DRILLING DATE:	5/22/2014
LOGGED BY:	AJB	SAMPLE METHOD:	BULK, RING, AND SPT	ELEVATION:	886.5

BORING: PT-4

(IMP C)

Depth (Feet)	Elevation (feet msl)	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0	886				SC		QUATERNARY UNDOCUMENTED FILL (Qudf): Loose to medium dense, slightly moist, brown silty fine grained SAND, with gravel.	
					"SM"		RESIDUAL SOIL: Hard, slightly moist, reddish brown fine grained sandy CLAY, oxidized.	
	883.5						CRETACEOUS GRANITIC ROCK (GRw): Very dense, slightly moist, gray diorite, extremely weathered, excavates to fine to medium grained SAND.	
5							Total Depth 3'	
10								
15								
20								
25								

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PROJECT:	HOLLYWOOD CASINO	DRILLER:	BAJA EXPLORATION	SHEET:	1 of 1
CTE JOB NO:	10-11795T	DRILL METHOD:	HOLLOW-STEM AUGER	DRILLING DATE:	5/22/2014
LOGGED BY:	AJB	SAMPLE METHOD:	BULK, RING, AND SPT	ELEVATION:	884

BORING: PT-5

(IMP C)

Depth (Feet)	Elevation (feet msl)	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0	884				SM/SC		QUATERNARY UNDOCUMENTED FILL (Qudf): Loose to medium dense, slightly moist, reddish brown to brown silty to clayey SAND.	
	881						Total Depth 3'	
5								
10								
15								
20								
25								

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1441 MONTIEL ROAD, SUITE 115 | ESCONDIDO, CA 92026 | 760.746.4955

PROJECT:	HOLLYWOOD CASINO	DRILLER:	BAJA EXPLORATION	SHEET:	1 of 1
CTE JOB NO:	10-11795T	DRILL METHOD:	HOLLOW-STEM AUGER	DRILLING DATE:	5/28/2014
LOGGED BY:	AJB	SAMPLE METHOD:	BULK, RING, AND SPT	ELEVATION:	928.2

BORING: PT-6

(IMP D)

Depth (Feet)	Elevation (feet msl)	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0	928				SM		QUATERNARY ALLUVIUM/COLLUVIUM/RESIDUALSOIL: Loose to medium dense, dry to slightly moist, reddish brown silty SAND.	
	925.5						Total Depth 3'	
5								
10								
15								
20								
25								

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1441 MONTIEL ROAD, SUITE 115 | ESCONDIDO, CA 92026 | 760.746.4955

PROJECT:	HOLLYWOOD CASINO	DRILLER:	BAJA EXPLORATION	SHEET:	1 of 1
CTE JOB NO:	10-11795T	DRILL METHOD:	HOLLOW-STEM AUGER	DRILLING DATE:	5/28/2014
LOGGED BY:	AJB	SAMPLE METHOD:	BULK, RING, AND SPT	ELEVATION:	927.5

BORING: PT-7

(IMP D)

Depth (Feet)	Elevation (feet msl)	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0	927.5				SM		QUATERNARY ALLUVIUM/COLLUVIUM/RESIDUALSOIL: Loose to medium dense, slightly moist, reddish brown silty fine grained SAND, oxidized.	
	924.5						Total Depth 3'	
5								
10								
15								
20								
25								

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PROJECT:	HOLLYWOOD CASINO	DRILLER:	BAJA EXPLORATION	SHEET:	1 of 1
CTE JOB NO:	10-11795T	DRILL METHOD:	HOLLOW-STEM AUGER	DRILLING DATE:	5/28/2014
LOGGED BY:	AJB	SAMPLE METHOD:	BULK, RING, AND SPT	ELEVATION:	928.5

BORING: PT-8

(IMP D)

Depth (Feet)	Elevation (feet msl)	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0	928.5				SM		QUATERNARY ALLUVIUM/COLLUVIUM/RESIDUALSOIL: Loose to medium dense, dry to slightly moist, reddish brown silty fine to medium grained SAND, oxidized.	
	925.5						Total Depth 3'	
5								
10								
15								
20								
25								

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1441 MONTIEL ROAD, SUITE 115 | ESCONDIDO, CA 92026 | 760.746.4955

PROJECT:	HOLLYWOOD CASINO	DRILLER:	BAJA EXPLORATION	SHEET:	1 of 1
CTE JOB NO:	10-11795T	DRILL METHOD:	HOLLOW-STEM AUGER	DRILLING DATE:	5/28/2014
LOGGED BY:	AJB	SAMPLE METHOD:	BULK, RING, AND SPT	ELEVATION:	905

BORING: PT-9

(Reservation Road)

Depth (Feet)	Elevation (feet msl)	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0	905				SM		GRANITIC ROCK (WEATHERED): Dense, dry to moist, excavates as light reddish to gray brown silty fine to medium grained SAND.	
	902							
							Total Depth 3'	
5								
10								
15								
20								
25								

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1441 MONTIEL ROAD, SUITE 115 | ESCONDIDO, CA 92026 | 760.746.4955

PROJECT:	HOLLYWOOD CASINO	DRILLER:	BAJA EXPLORATION	SHEET:	1 of 1
CTE JOB NO:	10-11795T	DRILL METHOD:	HOLLOW-STEM AUGER	DRILLING DATE:	5/28/2014
LOGGED BY:	AJB	SAMPLE METHOD:	BULK, RING, AND SPT	ELEVATION:	904.5

BORING: PT-10

(Reservation Road)

Depth (Feet)	Elevation (feet msl)	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0	904.5				SM		GRANITIC ROCK (WEATHERED): Dense, slightly moist, gray brown excavates to silty fine to medium grained SAND.	
	901.5						Total Depth 3'	
5								
10								
15								
20								
25								

CONSTRUCTION TESTING & ENGINEERING, INC.
GEOTECHNICAL | CONSTRUCTION ENGINEERING TESTING AND INSPECTION
1441 MONTIEL ROAD, SUITE 115 | ESCONDIDO, CA 92026 | 760.746.4955

PROJECT:	HOLLYWOOD CASINO	DRILLER:	BAJA EXPLORATION	SHEET:	1 of 1
CTE JOB NO:	10-11795T	DRILL METHOD:	HOLLOW-STEM AUGER	DRILLING DATE:	5/28/2014
LOGGED BY:	AJB	SAMPLE METHOD:	BULK, RING, AND SPT	ELEVATION:	904.5

BORING: PT-11

(Reservation Road)

Depth (Feet)	Elevation (feet msl)	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0	904.5				SM		QUATERNARY ALLUVIUM/COLLUVIUM/RESIDUALSOIL: Loose to medium dense, dry to slightly moist, reddish brown silty fine grained SAND, oxidized.	
					"SM"		GRANITIC ROCK (WEATHERED): Dense, slightly moist, grayish brown excavates to silty fine grained SAND.	
	901.5						Total Depth 3'	
5								
10								
15								
20								
25								

February 4, 2015 CTE-Project No. 10-11795T

Jamul Indian Village of California
14191 Highway 94
Jamul, California 91935

C/O: Marnell Architecture
Attention: Mr. Brandon T. Moore
222 Via Marnell Way
Las Vegas, Nevada 98119
Telephone: (702)739-2000 Via Email: bmoore@marnellcompanies.com
CC: San Dieguito Engineering, Mr. Ivan Fox Via Email: ifox@sdeinc.com

Subject: Proposed Stormchamber Evaluation of Percolation Rates
Jamul Indian Village Hollywood Casino
West Side of SR94, South of Melody Road
Jamul, California

Mr. Moore:

At your request, Construction Testing and Engineering, Inc. (CTE), has completed the requested the proposed Stormchamber percolation tests at the above referenced project. A total of four percolation tests were performed. Three of the actual percolation test locations closely match the design test locations that were provided by San Dieguito Engineering, Inc., within the Stormchamber proposed footprint (Figure 1). The remaining test was located to the south of the footprint due to access restrictions from an existing soil stockpile. The field investigation for proposed Stormchamber area was conducted on February 2 and February 3, 2015.

PERCOLATION TEST METHODOLOGY, CONDITIONS, AND RESULTS

Percolation tests were conducted at locations described above at and slightly above the targeted test elevation of 900 feet above mean sea level. Actual percolation test intervals ranged from approximately 901 to 900 feet above mean sea level. The geologic units encountered in the testing areas generally consisted of fill material, and residual soil (RS) on weathered granitic rock of diorite to granodiorite composition (GRw). The fill material was previously placed from on-site soils and generally consisted of silty sand with clay and fine subrounded gravel. Field-testing of the compacted fill material was conducted in accordance with ASTM D6938-08a (nuclear method). Results of the field-testing indicate that fill materials were compacted to at least 90 percent of the laboratory maximum dry density as determined by test method ASTM D 1557-02 at above optimum moisture contents.

The residual soil that was developed on granitic rock consisted of sandy clay that graded into extremely too highly weathered fractured diorite to granodiorite granite rock. The percolation tests were conducted in general accordance with the County of San Diego guidelines. The percolation rates account for both lateral and vertical flow through the tested section.

Water used to conduct the tests was stored in a polyurethane tank. Weather conditions during the test were overcast then became sunny during both presoaking and testing days. The Percolation testing methodology was determined following the presoak period per the County guidelines. In summary, Case I conditions are determined by water remaining overnight following an initial four-hour presoak. Case II is considered a fast draining soil in which two columns of 12-14 inches of water percolate in less than 30 minutes during the second presoak period that is conducted after a minimum of 15 hours of the initial presoak period. Case III conditions result when no water remains in the test hole 15-30 hour after the initial four-hour presoak, but does not meet Case II conditions during the second presoak period. All four of the percolation test locations met Case III requirements. The following table presents a summary of the percolation test results conducted within and adjacent to the proposed Stormchamber footprint.

Percolation Test	**Soil Type within Test Interval**	**Geologic Unit (at existing surface)**	**Test elevation (feet msl)**	**Proposed Target Invert Elevation (feet msl)**	**Percolation Rate (min./in.)**	**(in./min)**
SCP-1	Fill	Fill	901.1 to 900.2	900.0	32	3.1×10^{-2}
SCP-2	Fill	Fill	901.6 to 900.7	900.0	120	8.3×10^{-3}
SCP-3	Fill	Fill	901.1 to 900.2	900.0	53	1.8×10^{-2}
SCP-4	RS/GRw	Fill	901.8 to 900.9	900.0	240	4.2×10^{-3}

CONCLUSIONS

Percolation rates presented above represent the anticipated conditions based on previous percolation tests completed on for IMP Basins B and C. Percolation rates for both of these basins were tested in proposed locations west of Willow Creek in the area immediately south of the proposed Stormchamber area. The fill material that was placed in the proposed Stormchamber area was derived from a combination of soil types, including alluvium, residual soil, and weathered granitic rock and expressed percolation rates of the same order of magnitude as previous percolation tests completed in the respective soil types. The percolation rates recorded in the residual soil on weathered granitic rock were also of the same order of magnitude as previous percolation rates from IMP basins B and C on the west side of Willow Creek.

The depth of recently placed fill material within the footprint of the Stormchamber ranges in bottom elevations from approximately 900 feet msl to 884 feet msl from north to south across the Stormchamber footprint. This equates to approximately zero to six feet of fill below the proposed invert elevation of 900 feet msl for the Stormchamber. As shown in the above summary table there is some variation in the percolation rates within the fill material ranging from 3.1×10^{-2} to 8.3×10^{-3} inches per minute. As mentioned, the percolation test results for the weathered granitic rock that were completed for the IMP basins on the west side of Willow Creek and the recent test in the Stormchamber have rates on the order of 10^{-3} inches per minute.

Based on the following factors; variability of the percolation rates within the fill material; the observed fill thickness shallows from south to north form approximately six feet to zero beneath the proposed invert of the Stormchamber; and the rates within the weathered granitic rock will be the limiting rates over time; we recommend that the rates on the order of 10^{-3} inches per minute are conservative percolation rates that could be used in design for the Stormchamber area.

LIMITATIONS

As indicated, the precision of the percolation tests are limited due to the variability in soils, both naturally and man induced, across the site, and variable conditions during testing, such as climatic conditions, liquids, and equipment used. Therefore, the recorded percolation rates should be considered only as an index value.

We appreciate the opportunity to be of service on this project. Should you have any questions or need further information please do not hesitate to contact this office.

Respectfully submitted,

CONSTRUCTION TESTING & ENGINEERING, INC.

Dan T. Math, GE #2665
Principal Engineer

REGISTERED PROFESSIONAL ENGINEER
DANIEL T. MATH
No.2665
EXP.12/31/14
GEOTECHNICAL
STATE OF CALIFORNIA

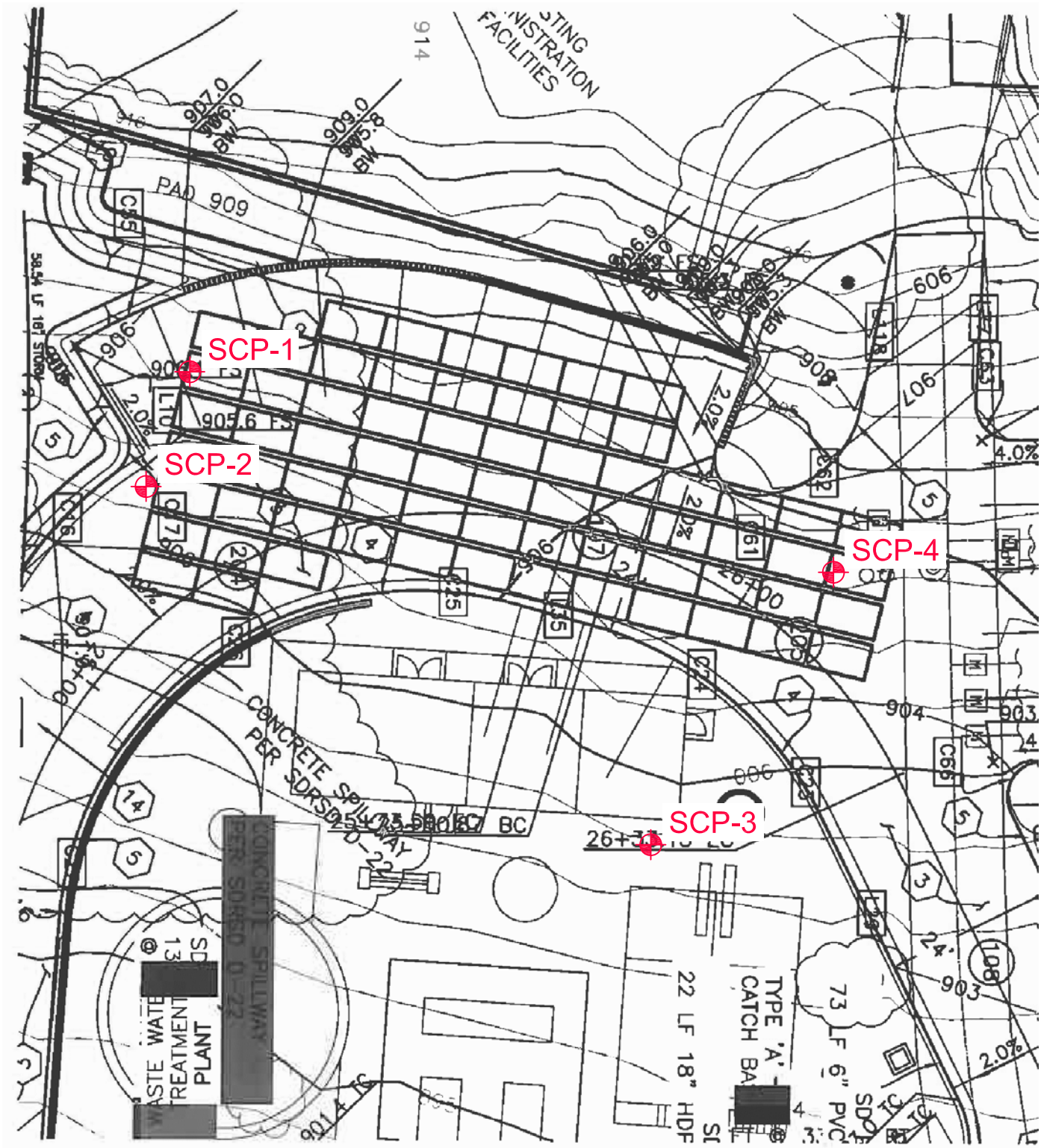
Martin E. Siem, CEG #2311
Senior Engineering Geologist

PROFESSIONAL GEOLOGIST
MARTIN E. SIEM
No.2311
CERTIFIED ENGINEERING GEOLOGIST
Exp. 6/30/14
STATE OF CALIFORNIA

MCB/MES/DTM:nri

Attachment:

Figures 1 Percolation Test Location Maps



LEGEND

SCP-4 ⊕ APPROXIMATE PERCOLATION TEST LOCATION

CTE INC. Construction Testing & Engineering, Inc.
1441 Montiel Rd Ste 115, Escondido, CA 92026 Ph (760) 746-4955

PERCOLATION TEST LOCATION MAP
PROPOSED STORM CHAMBER IMPROVEMENTS
HOLLYWOOD CASINO
14195 HIGHWAY 94
JAMUL INDIAN VILLAGE, CALIFORNIA

SCALE:	DATE:
1"=20'	2/15
CTE JOB NO.:	FIGURE:
10-11795T	1

\\ESC_SERVER\Projects\10-11000 to 10-11999 Projects\10-11795T\Figure 1 (Perc).dwg

February 18, 2015 CTE-Project No. 10-11795T

Jamul Indian Village of California
14191 Highway 94
Jamul, California 91935

C/O: Marnell Architecture
Attention: Mr. Brandon T. Moore
222 Via Marnell Way
Las Vegas, Nevada 98119
Telephone: (702)739-2000 Via Email: bmoore@marnellcompanies.com
CC: San Dieguito Engineering, Mr. Ivan Fox Via Email: ifox@sdeinc.com

Subject: Proposed East Stormchamber Evaluation of Percolation Rates
Jamul Indian Village Hollywood Casino
West Side of SR94, South of Melody Road
Jamul, California

Mr. Moore:

At your request, Construction Testing and Engineering, Inc. (CTE), has completed the requested the proposed Stormchamber percolation tests at the above referenced project. A total of three percolation tests were performed. All of the actual percolation test locations closely match the design test locations that were provided by San Dieguito Engineering, Inc., within the Stormchamber proposed footprint (Figure 1). The field investigation for proposed Stormchamber area was conducted on February 16 and February 17, 2015.

PERCOLATION TEST METHODOLOGY, CONDITIONS, AND RESULTS

Percolation tests were conducted at locations described above at and slightly above the targeted test elevations of 894 to 895 feet above mean sea level. Actual percolation test intervals ranged from approximately 896.0 to 894.0 feet above mean sea level. The geologic units encountered in the testing areas generally consisted of fill material, and residual soil (RS). The fill material was previously placed from on-site soils and generally consisted of silty sand with clay and fine subrounded gravel. Field-testing of the compacted fill material was conducted in accordance with ASTM D6938-08a (nuclear method). Results of the field-testing indicate that fill materials were compacted to at least 95 percent of the laboratory maximum dry density as determined by test method ASTM D 1557-02 at above optimum moisture contents.

The residual soil consisted of sandy clay that is expected to grade into extremely too highly weathered fractured diorite to granodiorite granite rock at depth. The percolation tests were conducted in general accordance with the County of San Diego guidelines. The percolation rates account for both lateral and vertical flow through the tested section.

Water used to conduct the tests was stored in a polyurethane tank. Weather conditions during the test were sunny during both presoaking and testing days. The Percolation testing methodology was determined following the presoak period per the County guidelines. In summary, Case I conditions are determined by water remaining overnight following an initial four-hour presoak. Case II is considered a fast draining soil in which two columns of 12-14 inches of water percolate in less than 30 minutes during the second presoak period that is conducted after a minimum of 15 hours of the initial presoak period. Case III conditions result when no water remains in the test hole 15-30 hour after the initial four-hour presoak, but does not meet Case II conditions during the second presoak period. Percolation test locations SCP-6 and SCP-7 met Case III requirements. Test location SCP-5 met Case I criteria. The following table presents a summary of the percolation test results conducted within the proposed Stormchamber footprint.

Percolation Test	**Soil Type within Test Interval**	**Geologic Unit (at existing surface)**	**Test elevation (feet msl)**	**Proposed Target Invert Elevation (feet msl)**	**Percolation Rate (min./in.)**	**(in./min)**
SCP-5	Fill	Fill	896.0 to 895.3	895.0	240	4.2×10^{-3}
SCP-6	Fill	Fill	894.7 to 894.0	894.0	96	1.0×10^{-2}
SCP-7	RS	Fill	895.7 to 895.0	895.0	60	1.6×10^{-2}

CONCLUSIONS

Percolation rates presented above represent the anticipated conditions based on previous percolation tests completed west of Willow Creek for IMP Basins B and C and the West Stormchamber location. The fill material that was placed in the proposed East Stormchamber area was derived from a combination of soil types, including alluvium, residual soil, and weathered granitic rock. The percolation rates from the fill were slightly slower than previous fill material tested. This is attributed to the compaction efforts to at least 95 percent of the laboratory maximum dry density in the East Stormchamber area adjacent to the access road as compared to 90 percent minimum compacted efforts in the West Stormchamber area. The residual soil expressed slightly higher percolation rates than previous test results in this soil type. However, the overall rates were of the same order of magnitude as previous percolation tests completed in the test areas west of Willow Creek.

The depth of recently placed fill material within the footprint of the East Stormchamber ranges in from approximately zero to six feet. The percolation test holes ranged in depth from approximately three to five feet, therefore only a couple of feet of fill will be present below the proposed invert elevation of 895 feet msl for the East Stormchamber. As shown in the above summary table there is some variation in the percolation rates within the fill material ranging from 4.2×10^{-3} to 1.0×10^{-2} inches per minute. As mentioned, the percolation test results for the residual soil were on the order of 10^{-2} inches per minute.

Based on the following factors; variability of the percolation rates within the fill material; the observed fill thickness shallows from north to south form approximately zero to six feet with only a thin layer of fill will be beneath the proposed invert of the Stormchamber; and the rates within the weathered granitic rock will be the limiting rates over time; we recommend that the rates on the order of 10^{-3} inches per minute are conservative percolation rates that could be used in design for the East Stormchamber area.

LIMITATIONS

As indicated, the precision of the percolation tests are limited due to the variability in soils, both naturally and man induced, across the site, and variable conditions during testing, such as climatic conditions, liquids, and equipment used. Therefore, the recorded percolation rates should be considered only as an index value.

We appreciate the opportunity to be of service on this project. Should you have any questions or need further information please do not hesitate to contact this office.

Respectfully submitted,

CONSTRUCTION TESTING & ENGINEERING, INC.

Dan T. Math, GE #2665
Principal Engineer

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STATE OF CALIFORNIA

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CERTIFIED ENGINEERING GEOLOGIST
Exp. 6/30/14
STATE OF CALIFORNIA

AB/MES/DTM:nri

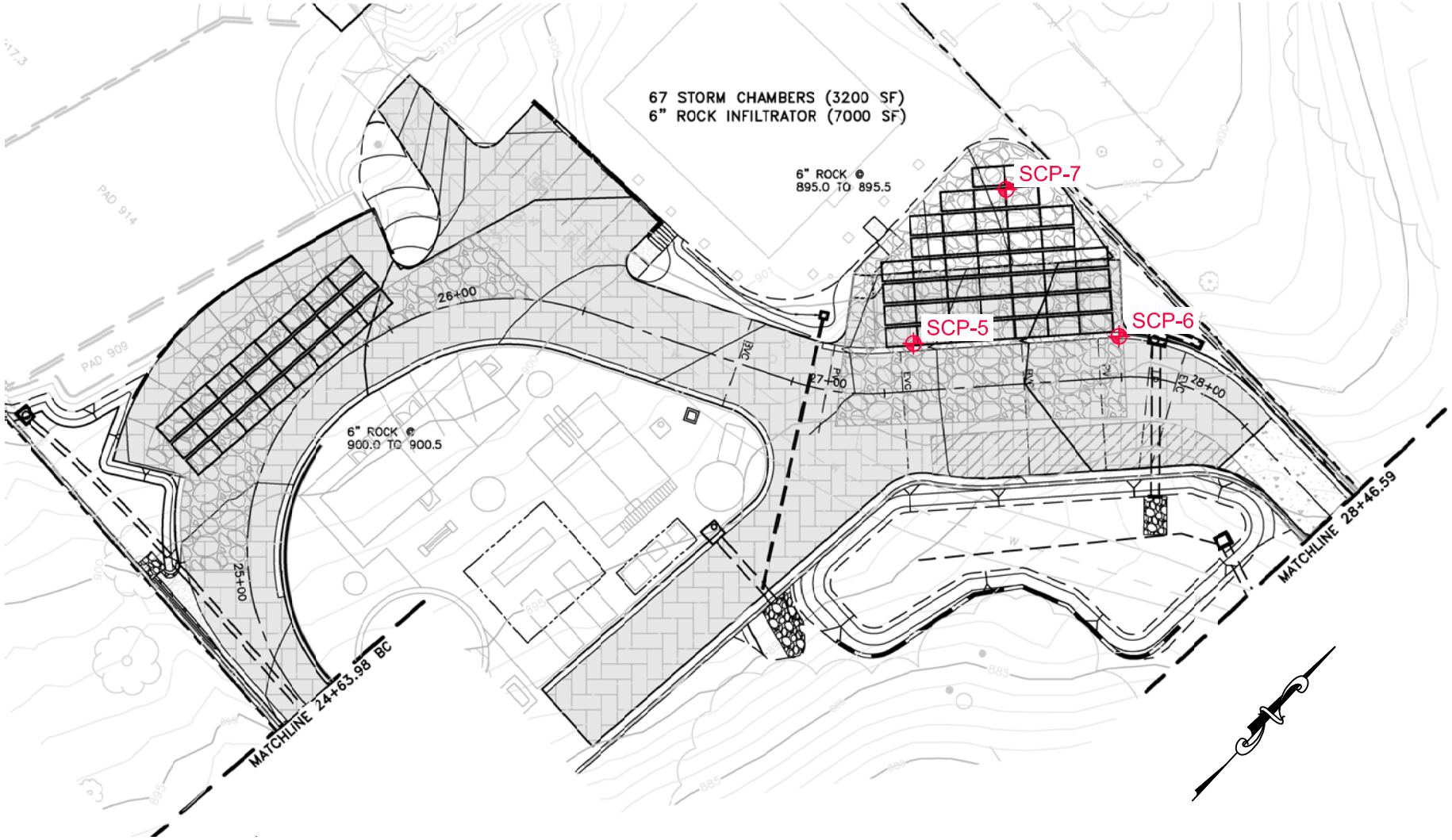
Attachment:

Figures 1 East Stormchamber Percolation Test Locations

\\Esc_server\projects\10-11000 to 10-11999 Projects\10-11795T\Percolation Testing\Figure 1 (2-15 Perc).dwg

LEGEND

SCP-7 ⊕ APPROXIMATE PERCOLATION TEST LOCATION



CTE INC. Construction Testing & Engineering, Inc.
1441 Montiel Rd Ste 115, Escondido, CA 92026 Ph (760) 746-4955

PERCOLATION TEST LOCATION MAP

PROPOSED IMP CATCH BASIN EVALUATION OF PERCOLATION RATES
WEST SIDE OF SR94, SOUTH OF MELODY ROAD
JAMUL, CALIFORNIA

CTE JOB NO:	10-11795T
SCALE:	1" = 40'
DATE:	2/15
FIGURE:	1

February 23, 2015 CTE-Project No. 10-11795T

Jamul Indian Village of California
14191 Highway 94
Jamul, California 91935

C/O: Marnell Architecture
Attention: Mr. Brandon T. Moore
222 Via Marnell Way
Las Vegas, Nevada 98119
Telephone: (702)739-2000 Via Email: bmoore@marnellcompanies.com

CC: Penn Gaming, Mr. Norm Nelms Via Email:norm.nelms@pngaming.com
San Dieguito Engineering, Mr. Ivan Fox Via Email: ifox@sdeinc.com

Subject: Summary of Percolation Rates and Rock Characterization
For Proposed Stormchamber Infiltration Design
Jamul Indian Village Hollywood Casino
West Side of SR94, South of Melody Road
Jamul, California

Mr. Moore:

At your request, Construction Testing and Engineering, Inc. (CTE), is providing this summary letter for the percolation tests that have been completed west of Willow Creek for the proposed Stormchamber infiltration areas and storm water IMP basins. In addition, we have also provided a summary of the rock characterization within the infiltration area based on our previous rock characterization investigations for the Waste Water Treatment Plant (WWTP), the entire Hollywood Casino site, and observations from ongoing grading and foundation operations.

A total of twelve percolation tests were completed west of Willow Creek over the course of three field investigations. Two of the investigations were for the proposed Stormchamber infiltration areas and the remaining investigation was completed for the proposed storm water IMP basins. The actual test locations were in close proximity to the design locations that were provided by San Dieguito Engineering, Inc., for each phase of work, and are presented on the attached Figures 1a, 1b, and 1c.

The three phases of percolation testing were completed on May 23, 2014 for IMP Basins B and C; on February 2 and 3, 2015 for the original Stormchamber area west of the WWTP; and on February 16 and 17, 2015 for the proposed Stormchamber area east of the Community Center. As referenced in Appendix A, the details for each investigation were presented in reports dated June 3, 2014, February 4, 2015, and February 18, 2015, respectively.

Reports characterizing the rock mass were completed as part of the overall Rock Mass Characterization Report, dated May 20, 2014, and the Preliminary Geotechnical Investigation Report for the WWTP, dated June 6, 2014, as referenced in Appendix A.

This summary letter presents the key results from these earlier investigations as they relate to the design of stormchamber infiltration system for the discharge of water from the WWTP during the peak rainy season of a 100-year storm event. It is our understanding that the discharge water is anticipated to meet Title 22 drinking water quality standards.

PERCOLATION TEST RESULTS

The geologic units encountered in the testing areas generally consisted of documented fill material and residual soil (RS) on weathered granitic rock of diorite to granodiorite composition (GRw). In the IMP Basin C, undocumented fill was present at the time of percolation testing in this area. This material has since been removed and replaced with documented fill material. The documented fill material was previously placed from on-site soils and generally consisted of silty sand with clay and fine gravel. Field-testing of the compacted fill material was conducted in accordance with ASTM D6938-08a (nuclear method). Results of the field-testing indicate that fill materials were compacted to at least 90 percent of the laboratory maximum dry density as determined by test method ASTM D 1557-02 at above optimum moisture contents, and at least 95 percent of the laboratory maximum dry density beneath roadways. The residual soil that was developed on granitic rock consisted of sandy clay that graded into extremely too highly weathered fractured diorite to granodiorite granite rock.

The percolation tests were conducted in general accordance with the County of San Diego guidelines. The percolation rates account for both lateral and vertical flow through the tested section. Water used to conduct the tests was stored in a polyurethane tank. The Percolation testing methodology was determined following the presoak period per the County guidelines. In summary, Case I conditions are determined by water remaining overnight following an initial four-hour presoak. Case II is considered a fast draining soil in which two columns of 12-14 inches of water percolate in less than 30 minutes during the second presoak period that is conducted after a minimum of 15 hours of the initial presoak period. Case III conditions result when no water remains in the test hole 15-30 hour after the initial four-hour presoak, but does not meet Case II conditions during the second presoak period. The following table presents a summary of the percolation test results conducted over the three investigations.

Percolatio Test*	San Diego County Percolation Test Method	Soil Type within Test Interval	Geologic Unit (at existing surface)*	Test elevation (feet msl)	Proposed Target Invert Elevation (feet msl)	Percolation Rate (min./in.)	(in./min)
STORMCHAMBER PERCOLATION TESTS							
SCP-1	Case III	Fill	Fill	901.1 to 900.2	900.0	32	3.1×10^{-2}
SCP-2	Case III	Fill	Fill	901.6 to 900.7	900.0	120	8.3×10^{-3}
SCP-3	Case III	Fill	Fill	901.1 to 900.2	900.0	53	1.8×10^{-2}
SCP-4	Case III	RS/GRw	Fill	901.8 to 900.9	900.0	240	4.2×10^{-3}
SCP-5	Case I	Fill	Fill	896.0 to 895.3	895.0	240	4.2×10^{-3}
SCP-6	Case III	Fill	Fill	894.7 to 894.0	894.0	96	1.0×10^{-2}
SCP-7	Case III	RS	Fill	895.7 to 895.0	895.0	60	1.6×10^{-2}
IMP BASINS B AND C PERCOLATION TESTS							
PT-1	Case I	B	GRw	883.6 to 883.0	886.5	240	4.2×10^{-3}
PT-2	Case I	B	GRw	885.6 to 885.0	886.5	480	2.1×10^{-3}
PT-3	Case III	B	GRw	887.1 to 886.5	886.5	96	1.0×10^{-2}
PT-4	Case I	C	GRw	884.1 to 883.5	884.5	160	6.3×10^{-3}
PT-5	Case II	C	Qudf	881.6 to 881.0	884.5	5	2.0×10^{-1}

*SCP= Stormchamber Percolation Test; PT=IMP Basin Percolation Test

** GRw = weathered granitic rock; Qudf = undocumented fill material; Fill = Documented Fill
RS = Residual Soil

Based on the collective percolation tests from the three investigations, the average percolation rate for the documented fill material is 1.43 x 10-2 inches per minute or 1.7 feet per day. The average percolation rate for the weathered granitic rock is 5.36 x 10-3 inches per minute or 0.64 feet per day. The residual soil encountered in SCP-7 was not included in the averaging of the percolation rates because this pedogenic soil may have developed on alluvium and not granitic rock, and therefore represents the sole test on a third soil type. The percolation rate for the undocumented fill was also not included because it has been removed.

GROUNDWATER ELEVATIONS

Groundwater was not encountered in the borings advanced for the WWTP geotechnical investigation. The borings were advanced to a maximum explored depth of approximately 20.5 feet bgs. This equates to approximate elevations ranging between 881 to 876 feet above mean sea level (msl). Based on review of previous on-site investigations, groundwater elevations in the vicinity of the proposed WWTP and associated improvements are expected to range between approximate elevations of 880 to 868 feet above msl.

Observations from temporary monitoring test holes that were excavated to the east of the subject site and Willow Creek, within the water storage tank area in 2014, indicated that groundwater was at approximate elevations of 870 to 872 feet above msl.

Invert elevations of the proposed Stormchamber infiltration areas range between approximately 894 to 900 feet above msl. Assuming historic high groundwater elevations of 880 feet above msl, the proposed infiltration areas will be approximately 14 to 20 feet above historic high groundwater elevations.

ROCK CHARACTERIZATION

As mentioned above the area west of Willow Creek, including the building pad for the WWTP and associated structures, and the proposed Stormchamber infiltration areas at design grades will be underlain with documented fill over granitic rock. The documented fill generally consists of a heterogeneous mixture of onsite soils that primarily consists of silty sand with clay and fine gravel. The granitic rock is of varying mineral compositions consisting of an intermixture of diorite, tonalite, and granodiorite. The granitic rock was divided into four map units based on the degree of weathering, rock strength, and rock hardness as part of the Rock Characterization study for the entire Hollywood Casino site. The four map units are identified by the symbols of GRw, GRt, GRm, and GR. With GRw consisting of extremely to highly weathered, very weak to weak granitic rock; GRm consisting primarily of moderately weathered, moderately strong granitic rock; GRt is the transitional zone between GRw and GRm and contains rock qualities of both map units. GR is primarily moderately to slightly weathered strong granitic rock. Detailed descriptions of the granitic rock can be found within the Rock Mass Characterization report, dated May 20, 2014 (Appendix A).

The granitic rock encountered within the WWTP explorations during grading operations west of Willow Creek was mapped as the GRw map unit that consisted of extremely to highly weathered granitic rock that is very weak to weak, with low hardness, locally friable, and locally grades upward into residual (saprolite) soil. The GRw granitic rock was observed from approximate elevations of 900 feet above mean sea level (msl) to depths of approximately 20 feet in the WWTP borings, or to equivalent elevations of approximately 875 feet above msl. A general observation from the Rock Characterization study was that extensive weathering and clay infilled fractures were associated with the map units GRw and GRt, and only a few fractures with clay were observed in the underlying map units, particularly map unit GR.

Oriented fracture data was divided into primary, secondary, and tertiary fracture sets based on the abundance of fracture orientations. Six primary joints sets, five secondary joint sets, and eight tertiary joint sets accounted for approximately 80% of the fracture orientations. The primary or most abundant joint sets appear to fall into three general ranges that trend from approximately N30-60E, N60-80W, and essentially east-west varying between N80E to N80W. Fracture spacing of the primary joint sets is within the five to ten feet range, with zones within the two to five feet range. However, the average fracture frequency in the GRw map unit was interpreted to be approximately one fracture per foot. Recognized fractures were found to consist primarily of narrow to very narrow joints with spotty iron-oxide stained, slightly rough planar surfaces. The higher fracture frequency in the GRw map unit is attributed to the low rock quality from extensive weathering.

Based upon our observations, limited fracture flow is anticipated within the GRw map unit due to the extreme weathering and clay infilling of the closely spaced tight to healed fractures. The rock groundmass is so weathered and locally friable that rock properties are more like a soil than a hard

rock. Observations of the bridge abutment foundations along Willow Creek indicated that groundwater flow is primarily along alluvial/residual soil to granitic rock contact. As the alluvial soils will be replaced by documented fill future flow is anticipated to travel along the documented fill- granitic rock contact. This is further indicated by the slightly faster percolation rates within the fill as compared to the weathered granitic rock, which indicates that as water infiltrates through the documented fill and encounters the less permeable weathered granitic rock a preferred pathway is anticipate downslope toward Willow Creek along this contact.

As noted above, the primary fractures are oriented perpendicular to oblique to Willow Creek and any fracture flow at depth along the fractures is also anticipated to intersect groundwater elevations and daylight along Willow Creek to the east and southeast of the infiltration areas. Although detailed studies of rock permeability, fracture flow, and storage capacity have not been performed, the proposed infiltrating waters are not generally anticipated to generate springs or raise extended groundwater levels above historic high levels.

LIMITATIONS

As indicated, the precision of the percolation tests are limited due to the variability in soils, both naturally and man induced, across the site, and variable conditions during testing, such as climatic conditions, and equipment used. Therefore, the recorded percolation rates should be considered an index value. Fracture flow within the granitic rock is interpretive and based on observations of onsite conditions. Detailed studies on fracture flow have not been conducted and are not considered mandatory for the short term influx of infiltration during historic rain events.

We appreciate the opportunity to be of service on this project. Should you have any questions or need further information please do not hesitate to contact this office.

Respectfully submitted,

CONSTRUCTION TESTING & ENGINEERING, INC.

Dan T. Math, GE #2665
Principal Engineer

REGISTERED PROFESSIONAL ENGINEER
DANIEL T. MATH
No.2665
EXP.12/31/14
GEOTECHNICAL
STATE OF CALIFORNIA

Martin E. Siem, CEG #2311
Senior Engineering Geologist

PROFESSIONAL GEOLOGIST
MARTIN E. SIEM
No.2311
CERTIFIED ENGINEERING GEOLOGIST
Exp. 6/30/14
STATE OF CALIFORNIA

AB/MES/DTM:nri

Attachments:
Appendix A References
Figures 1, 1a, 1b Percolation Test Location Maps

APPENDIX A

REFERENCES

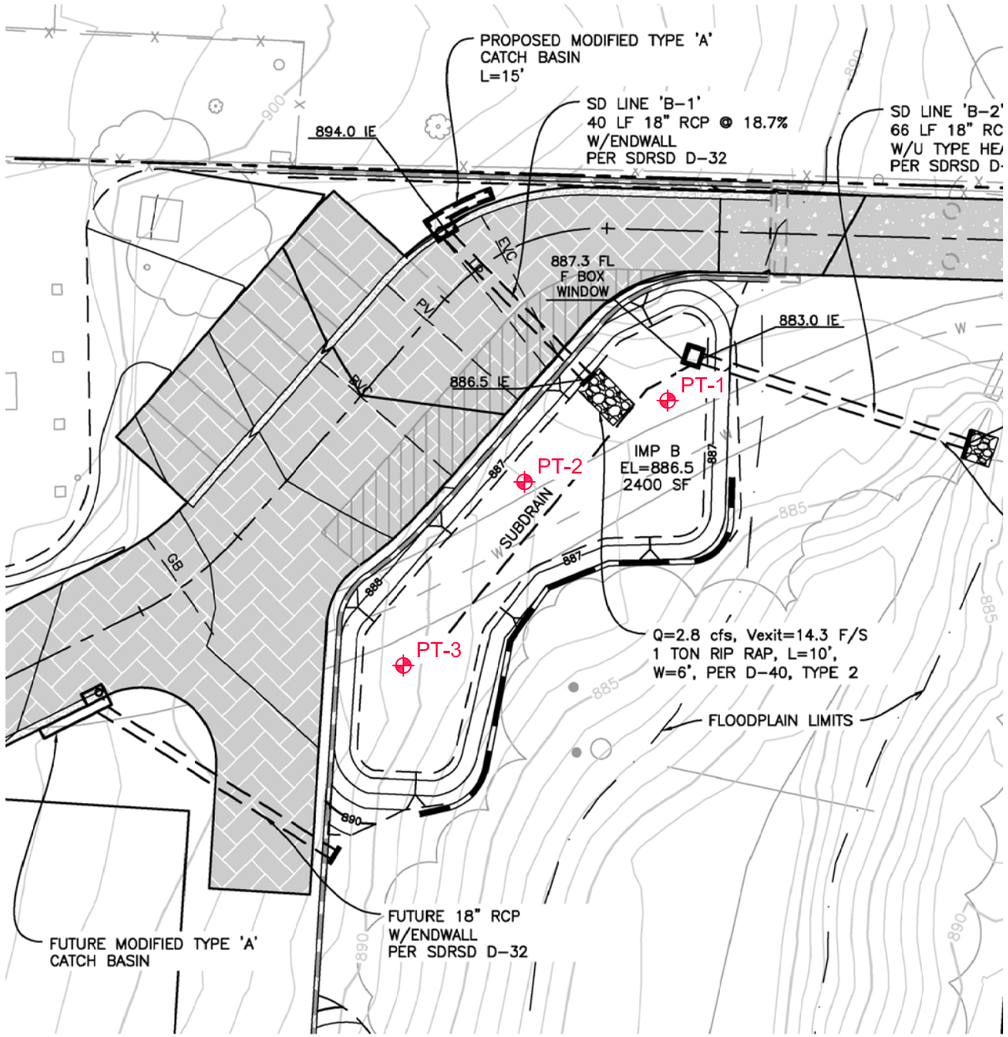
February 18, 2015, “Proposed East Stormchamber Evaluation of Percolation Rates” Jamul Indian Village Hollywood Casino West Side of SR94, South of Melody Road, Jamul, California. Report prepared by Construction Testing & Engineering, project number 10-11795T.

February 4, 2015,”Proposed Stormchamber Evaluation of Percolation Rates” Jamul Indian Village Hollywood Casino West Side of SR94, South of Melody Road Jamul, California. Report prepared by Construction Testing & Engineering, project number 10-11795T.

May 20, 2014 Geologic Characterization for Proposed Soil Nail Walls Jamul Indian Village Hollywood Casino West Side of SR94, South of Melody Road Jamul, California. Report prepared by Construction Testing & Engineering, project number 10-11795T.

June 3, 2014, “Proposed IMP Catch Basin Evaluation of Percolation Rates” Jamul Indian Village Hollywood Casino West Side of SR94, South of Melody Road Jamul, California. Report prepared by Construction Testing & Engineering, project number 10-11795T.

June 6, 2014, Preliminary Geotechnical Investigation, Proposed Waste Water Treatment Plant Jamul Indian Village Hollywood Casino, 14191 Highway 94 Jamul, California. Report prepared by Construction Testing & Engineering, project number 10-11795T.



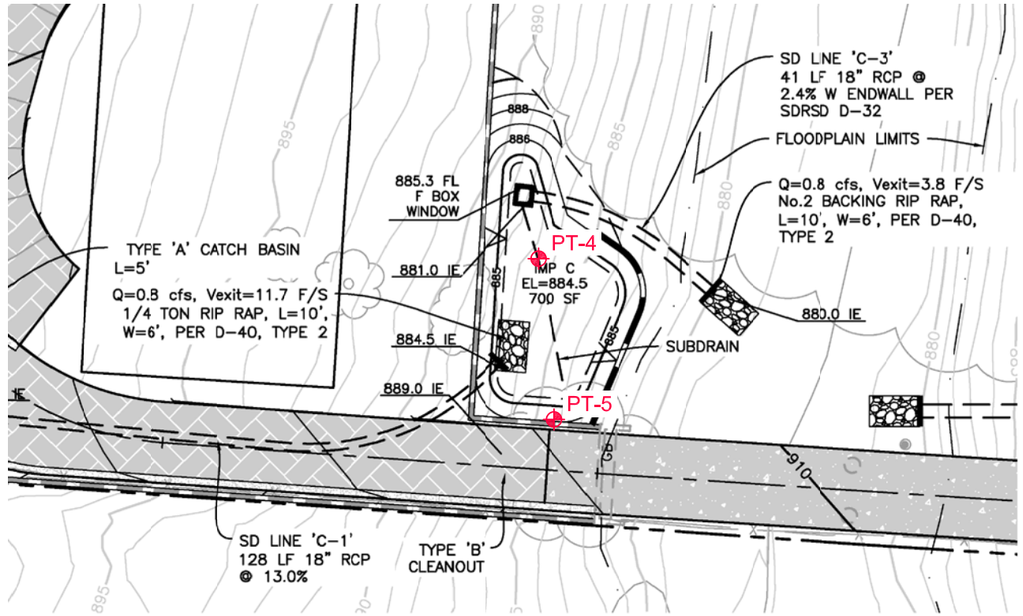
BASIN B (IMP)

LEGEND

PT-5 ⌖ APPROXIMATE PERCOLATION TEST LOCATION

30 0 15' 30'

1 inch = 30 ft.

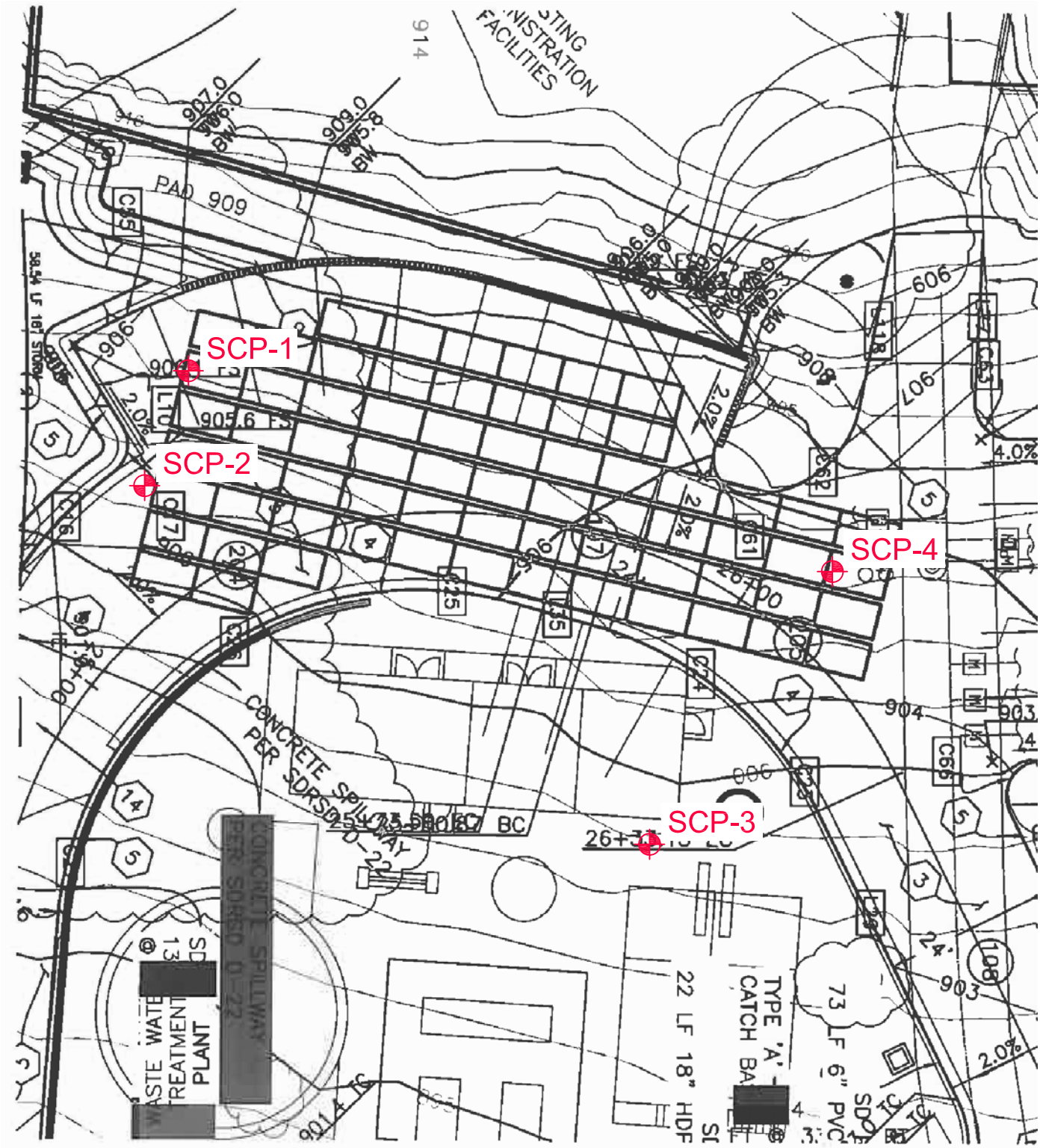


BASIN C (IMP)

CONSTRUCTION TESTING & ENGINEERING, INC.
PLANNING - CIVIL ENGINEERING - LAND SURVEYING - GEOTECHNICAL
1441 MONTIEL ROAD, SUITE 115 ESCONDIDO CA. 92026, PH:(760) 746-4955

EXPLORATION LOCATION MAP (IMP B & C)
JAMUL GAMING FACILITY DEVELOPMENT
JAMUL INDIAN VILLAGE
SAN DIEGO COUNTY, CALIFORNIA

CTE JOB NO:	10-11795G
SCALE:	1" ~ 30'
DATE: 2/15	FIGURE: 1



LEGEND

SCP-4 ⊕ APPROXIMATE PERCOLATION TEST LOCATION

CTE INC. Construction Testing & Engineering, Inc.
1441 Montiel Rd Ste 115, Escondido, CA 92026 Ph (760) 746-4955

PERCOLATION TEST LOCATION MAP
PROPOSED STORM CHAMBER IMPROVEMENTS
HOLLYWOOD CASINO
14195 HIGHWAY 94
JAMUL INDIAN VILLAGE, CALIFORNIA

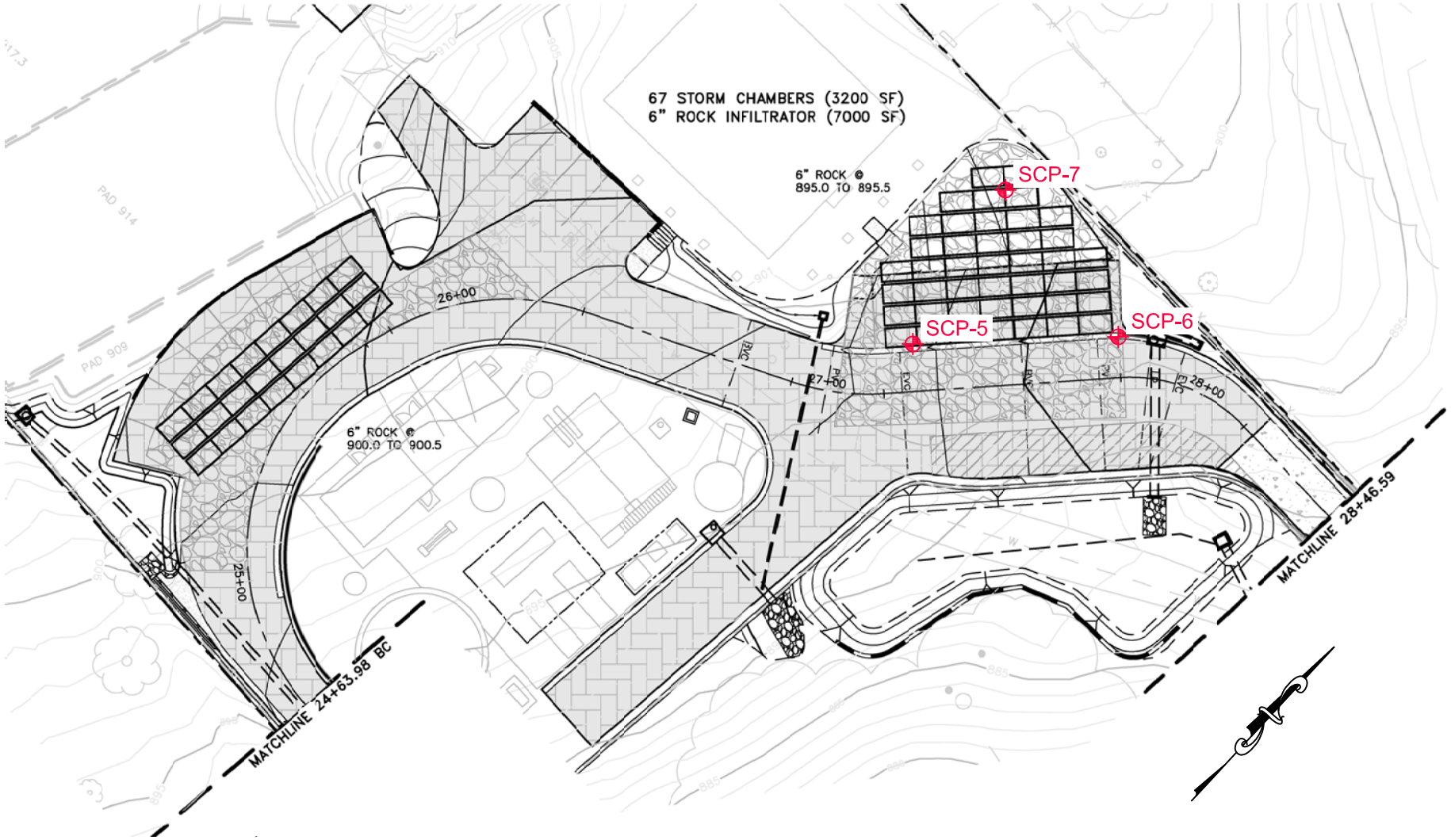
SCALE:	DATE:
1"=20'	2/15
CTE JOB NO.:	FIGURE:
10-11795T	1A

\\Esc_server\projects\10-11000 to 10-11999 Projects\10-11795T\Percolation Testing\Figure 1A (Perc).dwg

\\Esc_server\projects\10-11000 to 10-11999 Projects\10-11795T\Percolation Testing\Figure 1B (2-15 Perc).dwg

LEGEND

SCP-7 ⊕ APPROXIMATE PERCOLATION TEST LOCATION



CTE INC. Construction Testing & Engineering, Inc.
1441 Montiel Rd Ste 115, Escondido, CA 92026 Ph (760) 746-4955

PERCOLATION TEST LOCATION MAP

PROPOSED IMP CATCH BASIN EVALUATION OF PERCOLATION RATES
WEST SIDE OF SR94, SOUTH OF MELODY ROAD
JAMUL, CALIFORNIA

CTE JOB NO:	10-11795T
SCALE:	1" = 40'
DATE:	2/15
FIGURE:	1B

Construction Testing & Engineering, Inc.
Inspection | Testing | Geotechnical | Environmental & Construction Engineering | Civil Engineering | Surveying

February 27, 2015 (Revised March 9, 2015) CTE-Project No. 10-11795T

Jamul Indian Village of California
14191 Highway 94
Jamul, California 91935

C/O: Marnell Architecture
Attention: Mr. Brandon T. Moore
222 Via Marnell Way
Las Vegas, Nevada 98119
Telephone: (702)739-2000 Via Email: bmoore@marnellcompanies.com

CC: Penn Gaming, Mr. Norm Nelms, Via Email: norm.nelms@pngaming.com
San Dieguito Engineering, Mr. Ivan Fox, Via Email: ifox@sdeinc.com

Subject: Stormchamber Review and Consolidation Test Results
For Proposed Stormchamber Infiltration Design
Jamul Indian Village Hollywood Casino
West Side of SR94, South of Melody Road
Jamul, California

Mr. Moore:

At your request, Construction Testing and Engineering, Inc. (CTE), is providing this review of the latest proposed Stormchamber layout provided by San Dieguito Engineering, Inc., dated February 25, 2015. The present proposed layout for Stormchamber is located east of the existing Community Center and portions of the gravel infiltration blanket extend south and slightly west encompassing the northeast corner of the Waste Water Treatment Plant (WWTP) building pad. As designed, the gravel infiltration layer will be installed at an approximate two percent grade that slopes down towards the northeast. The gravel layer invert is anticipated to be at elevations between 895 to 894 feet above mean sea level (msl). Based on removal depths for the WWTP and adjacent access roads the base of the gravel infiltration layer will transition from being underlain by weathered granitic rock (at base of documented fill) to approximately 12 feet of fill east of the WWTP structures and west of Wall P.

The proposed layout is considered to be satisfactory from a geotechnical perspective, and extensive cutoff walls to prevent infiltration beneath the WTTP are not considered necessary with the proposed layout. However, CTE recommends that the Stormchamber excavation inclined perimeter wall option be employed as detailed in StormTech SC-740 Standard Cross Section. In addition, it is our recommendation that a minimum 20-mil impermeable membrane (with all laps and penetrations glued or heat welded) be installed along the perimeter excavation walls to promote vertical infiltration. At a minimum, for the side wall between the gravel zone and the WWTP building pad,

we recommend that a one foot deep and one foot wide (or larger if necessary to excavate) trench be excavated below the perimeter Stormchamber excavation and the impermeable linear extended continuously from the inclined perimeter wall to the base of the trench (see sketch on Attachment 1). Fill should then be placed in the trench and be recompacted to a minimum relative compaction of 95 percent at a moisture content of at least two percent above optimum, as evaluated by ASTM D 1557. If preferred, the trench could be backfilled with minimum two-sack cement/sand slurry.

The percolation rates from the percolation tests SCP-6 and SCP-7 (as presented in the Summary of Percolation Rates and Rock Mass Characterization letter, dated February 23, 2015) are considered the most representative based on the location of the current Stormchamber layout. The percolation rates for SCP-6 were calculated to be 0.5 feet per day, and the calculated results for SCP-7 were 1.2 feet per day. The average of these rates is 0.85 feet per day and is the recommended percolation rate for the Stormchamber design.

The results of a recent consolidation test completed on a sample of the previously placed and CTE documented fill material from the WWTP building pad indicates that the maximum post-construction settlement under saturated conditions could be on the order of two to three inches where maximum compacted fill depths of 25 feet are present near the tallest portions of adjacent walls. Maximum differential settlements are estimated to be on the order of 1/2 to 1 inch, over a distance of 40 to 50 feet. We anticipate that these maximum estimated post-construction total and differential settlements are within tolerable limits of the proposed improvements. However, project structural engineers of record should review this information and provide additional recommendations, if deemed necessary.

LIMITATIONS

The opinions presented herein are based on our observations, test results, and understanding of the proposed site development. Our service was performed according to the currently accepted standard of practice and in a way that provides a reasonable measure of the compliance of the grading operations with the job requirements. No warranty, express or implied, is given or intended with respect to the performance of the project in any respect. Submittal of this report should not be construed as relieving the grading contractor of his responsibility to comply with the project requirements.

We appreciate the opportunity to be of service on this project. Should you have any questions or need further information please do not hesitate to contact this office.

Respectfully submitted,

CONSTRUCTION TESTING & ENGINEERING, INC.

Dan T. Math, GE #2665
Principal Engineer

REGISTERED PROFESSIONAL ENGINEER
DANIEL T. MATH
No.2665
EXP.12/31/16
GEOTECHNICAL
STATE OF CALIFORNIA

Martin E. Siem, CEG #2311
Senior Engineering Geologist

PROFESSIONAL GEOLOGIST
MARTIN E. SIEM
No.2311
CERTIFIED ENGINEERING GEOLOGIST
Exp. 6/30/16
STATE OF CALIFORNIA

MES/DTM:nri

REFERENCES

February 18, 2015, "Proposed East Stormchamber Evaluation of Percolation Rates" Jamul Indian Village Hollywood Casino West Side of SR94, South of Melody Road, Jamul, California. Report prepared by Construction Testing & Engineering, project number 10-11795T.

February 4, 2015,"Proposed Stormchamber Evaluation of Percolation Rates" Jamul Indian Village Hollywood Casino West Side of SR94, South of Melody Road Jamul, California. Report prepared by Construction Testing & Engineering, project number 10-11795T.

May 20, 2014 Geologic Characterization for Proposed Soil Nail Walls Jamul Indian Village Hollywood Casino West Side of SR94, South of Melody Road Jamul, California. Report prepared by Construction Testing & Engineering, project number 10-11795T.

June 3, 2014, "Proposed IMP Catch Basin Evaluation of Percolation Rates" Jamul Indian Village Hollywood Casino West Side of SR94, South of Melody Road Jamul, California. Report prepared by Construction Testing & Engineering, project number 10-11795T.

June 6, 2014, Preliminary Geotechnical Investigation, Proposed Waste Water Treatment Plant Jamul Indian Village Hollywood Casino, 14191 Highway 94 Jamul, California. Report prepared by Construction Testing & Engineering, project number 10-11795T.

APPENDIX 2

SUPPLEMENTAL WASTEWATER HAULING NOISE, AIR QUALITY, AND GREENHOUSE GAS ASSESSMENT

Ldn Consulting, Inc.
446 Crestcourt Lane, Fallbrook CA 92028 phone 760-473-1253
www.ldnconsulting.net fax 760-689-4943

April 24, 2015

Mr. Joe Broadhead
Environmental Data Systems
1007 7th Street, Suite 308
Sacramento, CA 95814

Subject: Jamul Indian Village Gaming Facility Project – Supplemental Wastewater Hauling Noise, Air Quality, and Greenhouse Gas Assessment

This report assesses the changes in noise, air quality, and greenhouse gas (GHG) impacts from the changes made to the JIV Gaming Facility assessed in the 2013 Final Tribal EE (EE), associated with wastewater generation estimates, recycled water balance, storage capacity/location and disposal methods. It is not uncommon for refinements to be made to planning level estimates used for environmental documents as engineering teams change from planning to design/construction, plans mature and construction progresses. The refinements made to the JIV Gaming Facility wastewater estimates are a result of reduced occupancy estimates, as well as refinement of the reuse assumptions and elimination of the mechanical vapor compression (MVC) disposal assumption.

Revised Wastewater Generation estimates and Recycled Water Balance

For wastewater generation, a comparison of the 2013 Tribal EE estimates with current 2015 calculations of the gallons per day (gpd) are presented in Table 1.

TABLE 1
WASTEWATER FLOW ESTIMATES 2013 vs 2015

Item	2013 Final Tribal EE	Current 2015 Calculations	gpd Change
Gaming Facility Avg Daily Flow (gpd)	82,600	58,100	(24,500)
Gaming Facility Max Daily Flow (gpd)	123,900	88,350	(35,550)
Gaming Facility Peak Daily Flow (gpd)	165,200	118,600	(46,600)

SOURCE: Final Tribal EE, 2013; Marnell Companies, 2015

Mr. Joe Broadhead
Environmental Data Systems
1007 7th Street, Suite 308
Sacramento, CA 95814

Ldn Consulting, Inc.
446 Crestcourt Lane, Fallbrook CA 92028
phone 760-473-1253
Fax 760-689-4943

The revised numbers above, which resulted from reduced occupancy assumptions, show a reduction of approximately 29% for average daily, maximum daily and peak daily flows when compared with the original 2013 Final Tribal EE estimates.

Breaking down the yearly amount to account for month to month variability, **Table 2** below provides the comparison of excess recycled water estimated in the 2013 Final Tribal EE with the Current 2015 Estimate. As can be seen from **Table 2**, the maximum daily surplus of treated water would occur in January with an estimate of 37,419 gpd. The June through October period would result in no excess treated water, which is due to the high level of irrigation water needed during this period.

TABLE 2
MONTHLY TREATED WATER SURPLUS

Month	Daily Surplus: 2013 Final Tribal EE Estimate (gpd)	Daily Surplus: Current 2015 Estimate (gpd)
January	24,645	37,419
February	19,750	27,143
March	11,194	16,452
April	7,533	10,333
May	645	323
June	0	0
July	0	0
August	0	0
September	0	0
October	4,808	0
November	17,267	23,000
December	23,516	33,548

SOURCE: Final Tribal EE, 2013; Marnell Companies, 2015

Revised Storage Tank

The location and size of the treated water storage tank has been modified from assumptions made in the 2013 Final Tribal EE. The 2013 Final Tribal EE assumed that treated water would be temporarily stored in a 200,000 gallon capacity below-ground, bolted steel tank. Storage tanks are sized to accommodate up to two-three days of average flow. The 24 foot high, 38 foot diameter tank was to be built into the subterranean JIV Gaming Facility parking structure.

Mr. Joe Broadhead
Environmental Data Systems
1007 7th Street, Suite 308
Sacramento, CA 95814

Ldn Consulting, Inc.
446 Crestcourt Lane, Fallbrook CA 92028
phone 760-473-1253
Fax 760-689-4943

The revision is for this bolted steel tank to be located above-ground within the WWTP complex on the west side of the JIV Reservation. The tank has been downsized to a 130,000 gallon capacity and would measure 24 feet high with a 34 foot diameter. The 130,000 gallon capacity represents a 2.23 day capacity of the revised average water generation estimate.

Revised Treated Water Disposal Method

The 2013 Final Tribal EE assumed use of a MVC evaporator near the wastewater treatment plant to reduce the volume of treated water. The MVC system was to be sized for an evaporation rate allowing for the elimination of up to 40,000 gpd of treated water, which would have provided sufficient evaporation capacity to address the 25,000 gallon maximum excess wastewater generated during January[1]. The current proposal is to use a combination of on-site disposal and water trucking to San Diego Metro Pump Station No. 1 Receiving Station located on East Harbor Drive in the City of San Diego. The MVC has been eliminated from consideration due to the need to use natural gas to fuel the MVC.

A portion of the treated water would now be disposed of within an on-Reservation disposal system located in two locations on the west side of the JIV Reservation. Site 1 is located east of the existing Tribal Community Center, while Site 2 is located immediately west of the WWTP. Combined, these two sites are capable of accommodating the worst case amount of excess water generated during the month of January (37,419 gpd). However, in order to provide 100% redundancy for the on-site disposal system, only half of the available disposal area would be used at any one time. This translates to on-site disposal capacity of approximately 18,700 gpd with 100% redundancy provided. Operating the on-site disposal system with 100% redundancy would result in the need to truck water off site during select months of the year. **Table 3** below shows the amount of treated water to be disposed via water trucking following use of on-site disposal (broken down by month).

The remaining treated water shown in **Table 3** would be disposed via water trucking to the San Diego Metro Pump Station No. 1 Receiving Station, which is approximately 23 miles from the Reservation. As shown in **Table 3**, off-site trucking would only be needed four months out of the year. Assuming trucks capable of transporting 5,000 gallons of treated water, it would require 303 trucks per year, with a maximum daily export of 4 trucks during the month of January.

[1] / 2013 Final Tribal EE January estimate

Mr. Joe Broadhead
Environmental Data Systems
1007 7th Street, Suite 308
Sacramento, CA 95814

Ldn Consulting, Inc.
446 Crestcourt Lane, Fallbrook CA 92028
phone 760-473-1253
Fax 760-689-4943

TABLE 3
MONTHLY TREATED WATER SURPLUS
LESS ON-SITE DISPOSAL

Month	Daily Surplus to be Disposed after On-Site Disposal	Trucks Required Daily for Net Surplus
January	18,719	4
February	8,443	2
March	0	0
April	0	0
May	0	0
June	0	0
July	0	0
August	0	0
September	0	0
October	0	0
November	4,300	1
December	14,848	3

SOURCE: Final Tribal EE, 2013; Marnell Companies, 2015

Noise

As noted, the proposed changes would require the export of waste water and a resultant generation of truck trips for hauling. Based on engineering estimates, the project would generate as much as an additional 8 round truck-trips per day during the winter months. Assuming an 8 hour day of hauling, this would result in a maximum pass by of 2 trucks in any give hour. The increase in traffic volumes and shift in vehicle classification, i.e. the increased ratio of heavy trucks relative to other vehicles, along this segment of SR-94 would result in a maximum increase in noise levels along SR-94 between the project site and SR-54 of less than 1 dBA. While noise levels would increase slightly, these increases would not represent a substantial permanent increase in noise levels. The change in noise levels associated with the additional haling is summarized in Table 4.

Mr. Joe Broadhead
Environmental Data Systems
1007 7th Street, Suite 308
Sacramento, CA 95814

Ldn Consulting, Inc.
446 Crestcourt Lane, Fallbrook CA 92028
phone 760-473-1253
Fax 760-689-4943

Table 4
Change in Noise levels

Location or Address	Land Use	Existing dBA Leq	Proposed Project dBA Leq	Proposed Hauling dBA Leq	Change vs Existing dBA Leq	Change vs Original dBA Leq
13967 Highway 94	Commercial	63	63	63	0	0
13975 Highway 94	Commercial	62	63	63	1	0
14022 Hillside Dr	Residential	53	54	54	1	0
14017 Hillside Dr	Residential	56	57	57	1	0
14022 Highway 94 A	Residential	55	57	57	2	0
14022 Highway 94 B	Residential	62	63	63	1	0
14019 Highway 94	Commercial	64	65	65	1	0
14075 Short Ct	Residential	55	56	56	1	0
14027 Hillside Dr	Residential	56	56	56	2	0
14024 Highway 94	Residential	56	57	57	1	0
14023 Campo Dr	Residential	55	56	56	1	0
14043 Highway 94	Residential	50	52	52	2	0
14051 Campo Rd	Residential	57	58	58	1	0
14061 Campo Rd	Residential	42	44	44	2	0
14018 Las Palmas Rd	Residential	57	58	58	1	0
14013 Las Palmas Rd	Residential	56	57	57	1	0
14031 Las Palmas Rd	Residential	50	53	53	3	0
14066 Highway 94	Residential	53	56	56	3	0
3023 Calle Mesquite	Residential	46	48	48	2	0
3015 Calle Mesquite	Residential	46	49	49	3	0
3007 Calle Mesquite	Residential	47	51	51	4	0
14024 Peaceful Valley Ranch Rd	Fire Station	58	61	61	3	0
14102 Peaceful Valley Ranch Rd	Residential	42	42	42	0	0
44114 Campo Rd	Residential	46	47	47	1	0
Jamul Reservation Church	Religious	46	47	47	1	0

SOURCE: Final Tribal EE, 2013

Ldn Consulting, Inc.
446 Crestcourt Lane, Fallbrook CA 92028
phone 760-473-1253
Fax 760-689-4943

Based on the results of the preceding assessment, the proposed changes in project would not result in a substantial increase in noise levels along SR-94 more than predicted in the JIV TEE. Therefore, the increase would not result in new impacts or require new mitigation. Therefore, the noise impacts identified in the TEE would remain the same.

Air Quality

The additional truck trips associated with the hailing of Treated waste water would result in a slight increase in long-term emissions from operations over what was assessed in the JIV TEE. As indicated in the project description, the revised project would generate an additional trips for four months. Based on the maximum daily trips shown above in Table 3 and a round trips distance of 46 miles distance, the truck trips would generate on a maximum of 368 vehicle mile traveled daily in January.

Table 1 summarizes the total operational emissions of the project combined with the emissions from the additional hauling. As shown in Table 5, even with the emissions associated with the additional hauling, the project would not exceed the identified thresholds. Thus, the air quality impacts identified in the TEE would remain the same.

Table 5
Air Quality Emissions Summary
(Pounds/day)

Operational Emissions Source	VOC	NOX	CO	SOX	PM10	PM2.5
Original Project						
Total Unmitigated Emissions	33.9	44.4	393.3	0.5	83.7	16.2
Revised Project						
Additional Hauling Emissions	1.9	47.3	6.9	0.1	0.6	0.6
Total Emissions	35.8	91.7	400.2	0.6	84.3	16.8
De Minimis Thresholds	*75*	*250*	*550*	*250*	*100*	*55*
Exceeds Threshold levels?	No	No	No	No	No	No

SOURCE: Final Tribal EE, 2013; Marnell Companies, 2015

Greenhouse Gas Emissions

As stated in the project description, the project would require more hauling of treated waste water than assessed in the TEE. These additional truck trips would result in a slight increase in GHG emissions from operations over what was assessed in the JIV TEE. The revised project

Ldn Consulting, Inc.
446 Crestcourt Lane, Fallbrook CA 92028
phone 760-473-1253
Fax 760-689-4943

would generate an additional 303 trips annually, resulting in 26,496 annual vehicle miles traveled.

A revised operation emissions estimate is provided in Table 6 and compared to the original project's emissions. As shown, total operational GHG emissions resulting from the proposed project were estimated to be approximately 10,407 metric tons of carbon monoxide equivalent ($MTCO_2e$) per year. The additional hauling emissions would increase total project emissions to 10,443 $MTCO_2e$, an approximate one percent increase. To reduce GHG emissions the project includes several mitigation measures.

TABLE 6
GHG EMISSIONS SUMMARY
($MTCO2_E$)

SOURCE	ORIGINALLY PROPOSED PROJECT	PROPOSED PROJECT – TREATED WASTE WATER HAULING
Transportation	7,730	7,766
Natural Gas	90	90
Electricity	2,177	2177
Water Usage	53	53
Wastewater Treatment	118	118
Solid Waste	239	239
Total	10,407	10,516

Combining all regulatory measures identified in the JIV Air Quality Report, such as Pavley, Low Carbon Fuel Standards, utility reduction goals required by the State and recycling requirements under AB 341 along with design features and the following previously identified mitigation measures, would be expected to reduce GHGs, from the Business as Usual levels, and represents the project's effort to meet it fair share of the goals under AB 32.

- The project is installing green roof technologies and will capture treated water for use in the landscaped areas and on the roof.
- The project will provide solar panels on the roof, where possible, in areas not being utilized for the green roof technologies.
- The project will provide shuttle and bus services to and from the project to reduce vehicle trips and miles traveled.
- The project will flared off and burned CH4 produced at the wastewater treatment plant to reduce CH4 emissions up to 95%.

Mr. Joe Broadhead
Environmental Data Systems
1007 7th Street, Suite 308
Sacramento, CA 95814

Ldn Consulting, Inc.
446 Crestcourt Lane, Fallbrook CA 92028
phone 760-473-1253
Fax 760-689-4943

- The project will utilize low flow water devices High Efficiency Toilets (HET) and with specifications meeting or exceeding standards set forth by the EPA
- The project will install low energy utilities (i.e., lighting and appliances) to increase building efficiency and reduce power consumption.
- The project will promote employee and patron ridesharing to help reduce vehicle trips traveled.
- The project will install dedicated parking stalls and charging stations for electric vehicles.

The project may also incorporate other emission reduction strategies that are available at the time the facilities are being built that may also achieve additional reductions in greenhouse gases. Therefore, the additional hauling trips would not change the findings of the TEE.

If you have any questions, please contact me directly at (760) 473-1253.

Sincerely,
Ldn Consulting, Inc.

Jeremy Louden, Principal

APPENDIX 3

GEOLOGIC CHARACTERIZATION FOR PROPOSED SOIL NAIL WALLS

CONSTRUCTION TESTING & ENGINEERING, INC.
1441 MONTIEL ROAD, SUITE 115 | ESCONDIDO, CA 92026 | 760.746.4955 | FAX 760.746.9806

May 20, 2014 CTE Job No.: 10-11795T

Jamul Indian Village of California
14191 Highway 94
Jamul, California 91935

C/O: Marnell Architecture
Attention: Mr. Brandon T. Moore
222 Via Marnell Way
Las Vegas, Nevada 98119
Telephone: (702)739-2000 Via Email: bmoore@marnellcompanies.com

Subject: Geologic Characterization for Proposed Soil Nail Walls
Jamul Indian Village Hollywood Casino
West Side of SR94, South of Melody Road
Jamul, California

Mr. Moore:

As requested, CTE is providing this updated site characterization report for the proposed Jamul Indian Village Hollywood Casino project. This additional investigation focused on the need for additional characterization of the rock mass structural integrity within the proposed excavation back cuts for the currently designed soil nail tip areas. The walls are presently designed with soil nails that will penetrate beneath the project property limits along the eastern and southern boundaries of the site, which are only partially accessible due to easement rights that prohibit the advancement of additional explorations past the subject site property limits. However, the location of the additional explorations within the property limits did allow for the characterization of the rock mass behind several of the designed soil nail walls and provided information that is considered representative of the rock mass in general for the entire area.

1.0 SCOPE AND METHODOLOGY

The goal of our additional investigation/evaluation was to assess soil and rock materials and properties at the site with respect to their suitability for support of the proposed construction. Specifically, our goal was to characterize the rock fabric that is to be retained by the proposed soil nail walls. To accomplish this goal we incorporated findings from previous site investigations (Appendix A), which included the re-logging of eight previously advanced combined hollow stem augured and HQ cored borings (CB-1 through CB-8), and two hollow stem borings (CB-9 and CB-10), that were completed at the site in 2012. These borings were originally advanced to address a different scope of work than what is required for the current project design. In addition, we advanced four new HQ triple tube oriented continuous core borings (OC-1 through OC-4), and conducted fracture (joint) surveys of existing rock outcrops within the on-going site excavation. The

locations of the core borings utilized in this investigation are presented on Figure 1. The logs of the core borings are presented in Appendix B, and core photographs are presented in Appendix C.

The HQ core borings were advanced with a trailer-mounted drilling rig (LF-70) by Ruen Drilling, Incorporated. The retrieved core was geologically logged in the field and subsequently reviewed by CTE geologists. In addition, Acoustic Televiewer geophysical surveys were run in each core boring to obtain oriented fracture data. The geophysical surveys were conducted by GeoVision Geophysical Services. Laboratory analysis were completed on select rock core samples, and included analysis for direct shear, triaxial shear strength, unit weights, unconfined compression strength, particle size distribution, moisture density, Expansion Index potential, Resistance "R"-Values, and Modified Proctor maximum dry densities and optimum moisture contents. Laboratory tests results are summarized in Appendix D and are presented on the core logs and figures to aid in visual and spatial distribution of the rock properties. The Acoustic Televiewer geophysical surveys are presented in Appendix E.

The findings from the above investigations were used to construct six geologic cross-sections across the site (Figures 2 through 7 show Cross-Sections A-A' through F-F', respectively). The cross-sections were correlated at intersection points to help establish structural and stratigraphic continuity and incorporate the interpreted geology, laboratory test results, and soil nail wall details as presented on the site shoring plans completed by the project structural/soil nail wall engineer, PB&A Inc., dated April 7, 2014.

2.0 FIELD INVESTIGATION

As stated above, the recent field investigation included the advancement of four continuous core boings. Details of the core borings including drill length, orientation, degree of inclination, and surface elevations, as provided by CW Driver, and are presented in the following Table 1.

TABLE 1
OC CORE BORING CONSTRUCTION DETAILS

Boring ID	Surface Elevation (ft.-msl)	Trend	Inclination (degrees from vertical)	Drill Length (feet)	Elevation At Vertical Total Depth
OC-1	922.9	S6W	29.7	83.5	850.4
OC-2	934.9	S54W	25.1	83.7	859.3
OC-3	963.4	N32W	15.2	113.5	853.9
OC-4	944.8	N89E	14.6	85.8	861.8

The borings were inclined to provide a greater area to intersect fracture orientations and to allow attempts for orientation of each core run. The method attempted to orient each core run consisted of dropping a core barrel that is weighted along its invert axis. The weighted barrel tip, (typically

referred to as the shoe) was filled with a modeling clay plug for the purpose of making a mold of the in-situ rock at the end of each core run. The barrel and clay plug were extracted and the mold imprint was compared to the base of the extracted core so the core can be rotated to match the surveyed orientation of the core boring. However, due to the poor quality of the rock, this method was only sporadically successful and the orientation was typically suspect. Therefore, upon completion of the first core boring, it was decided and approved by the client, to run the Acoustic Televiewer survey in each core boring to better obtain oriented core data.

Field logging of the core consisted of identifying rock type, degree of weathering, relative rock strength, and rock hardness. In addition, percent core recovery, Rock Quality Designation (RQD), fracture frequency, and fracture descriptions were recorded. Fracture descriptions are included on each core log and a key to descriptive terms used to characterize type of fracture, fracture width, degree and type of infilling material, planarity, and surface roughness, is also presented in Appendix B.

The re-logging of the previous cores (CB-1 through CB-8) included recording the same data as described above; however, the previous cores were not oriented and were advanced as vertical borings. The focus of this initial coring program was to evaluate the RQD of the rock mass. Coring was initially attempted from the surface within the upper extremely- to highly-weathered granitic rock, which by definition is rock of very poor to poor quality. Therefore, the CB borings were drilled with hollow stem augers through the upper extremely- to highly-weathered granitic rock to refusal depths, and then the drilling process was switched to HQ coring within the rock mass that varied from highly- to slightly-weathered. Fracture data was obtained only from the cored intervals. The re-interpreted CB logs are also presented in Appendix B. Details of the CB borings are presented in the following Table 2.

TABLE 2
CB BORING CONSTRUCTION DETAILS

Boring ID	Approximate Surface Elevation	Inclination	Drill Length/Total Depth	Elevation Total Depth	Start Depth of Coring	Elevation at start of Coring
CB-1	906	vertical	50	856	34	872
CB-2	892	vertical	49.5	842.5	30	862
CB-3	959	vertical	93	866	35	924
CB-4	965	vertical	119.5	845.5	65	900
CB-5	945	vertical	91	854	45	900
CB-6	940	vertical	83	857	60	880
CB-7	935	vertical	80	855	45	890
CB-8	900	vertical	45	855	17	883
CB-9	895	vertical	50	845	N/A	N/A
CB-10	890	vertical	50	840	N/A	N/A

The percent recovery and RQD values were measured in the field for the OC borings and re-measured during review of the CB borings. The following Table 3 summarizes the average percent recovery and average RQD for all of the borings and the total average percent recovery and RQD for each set of borings. Percent recovery and RQD data for individual core runs within each boring are presented on the core logs in Appendix B, and in summary tables within Appendix F. Empirical rock quality ratings based on the measured RQD values for the recognized rock map units are presented within Section 3.2.

TABLE 3
SUMMARY OF PERCENT RECOVERY AND RQD

Boring ID	Average Percent Recovery	Average RQD	Boring ID	Average Percent Recovery	Average RQD
OC-1	96.7	75.6	CB-1	66.0	45.5
OC-2	93.0	59.4	CB-2	26.3	20.5
OC-3	97.6	40.3	CB-3	57.9	49.1
OC-4	95.9	72.1	CB-4	49.9	10.5
			CB-5	87.4	72.4
			CB-6	73.6	27.2
			CB-7	86.3	40.1
			CB-8	52.6	47.3
Total Averages	95.8	61.8		62.5	39.1

3.0 ROCK DESCRIPTION AND DISTRIBUTION

The data from the OC and CB borings and supplemental information from the air track borings that were completed to evaluate rippability at the site (2012a) were used to construct six geologic cross-sections. Three of the cross-sections (A-A', B-B', C-C') are oriented east-west across the site, (Figure 2, Figure 3, and Figure 4 respectively). Cross-sections D-D' and E-E' are oriented essentially north-south across the site (Figure 5 and Figure 6), and cross-section F-F' is generally oriented northeast to southwest across site (Figure 7). The locations of the cross-sections are presented on Figure 1.

As shown on the geologic cross-sections, surficial geologic map units identified at the site include artificial fill material, alluvium/colluvium, residual soils that have developed upon the alluvium/colluvium and residual soil that developed upon the underlying granitic rock.

3.1 Map Units

A brief description of the above mentioned map units are described below.

Af-Qal-Qcol/rs: This map unit consists of artificial fill material (af), Quaternary alluvium (Qal), Quaternary colluvium (Qcol), and a pedogenic soil profile that has developed upon Quaternary alluvial and colluvial deposits. The artificial fill is sporadically distributed around the site and consists of mixtures of the natural underlying deposits and localized debris. The alluvium and colluvium consists primarily of brown-gray, brown to dark brown, loose to medium dense silty sands. In areas, a brown to dark brown, pedogenic soil has developed upon the alluvium and colluvium. The soil is locally well developed and consists of sandy clay with well-developed clay films and interstitial clay, with a moderate to well-developed blocky texture. The majority of these materials are to be removed during the proposed site grading activities.

rs (saprolite): This map consist of a pedogenic soil that has developed upon granitic rock surfaces, and consists of red-gray to red-brown, silty sand to clayey sand, with fine to coarse sand grains. Locally the soil is weakly developed and is gradational with overlying colluvial and alluvial deposits. In other areas the soil is very well developed and consists of dark red, to red-gray brown sandy clay with coarse sand grains, pore spaces entirely filled with clay, and a massive to blocky texture. The lower contact is gradational and exhibits relict granitic rock fabric with depth. The unit eventually grades into an extremely weathered friable granitic rock.

Granitic Rock (GR): Granitic rock observed generally consists of a heterogeneous mixture of varying mineral compositions consisting of an intermixture of diorite, tonalite, and granodiorite. The granitic rock mass varies from massive fine subhedral granular texture to slightly porphyritic diorite, diorite xenoliths within a fine to coarse subhedral granular tonalite to granodiorite groundmass, and as diorite with veins of granodiorite. The rock fabric varies from being massive to flow banded with a weakly defined swirling macroscopic foliation. A more developed microscopic foliation is suggested by locally developed low angle subparallel parting surfaces. Weathering of the rock mass is extensive, with varying degrees of mineral alteration and replacement to secondary mineral populations. Pseudomorphs of plagioclase to clay minerals are developed to varying degrees. Fractures are ubiquitous throughout the rock mass and are typically tight to narrow features with iron-oxide staining primarily from the breakdown of biotite and the other mafic mineral populations consisting of pyroxene and amphiboles. Minor sulfides were recognized, as evidenced by pyrite pseudomorphs. The clay infilling consists of a white, greasy, non-plastic, low density material. This material could be seen coating plagioclase crystals and smeared from crystal to crystal, to very narrow to wide (1/2 inch to 1.5 inches thick) joint infillings that locally express slickensided surfaces indicating past shearing. The clay byproduct is believed to be kaolinite, however this is based on visual identification and association only, and no additional microscopic or chemical tests have been performed to confirm this identification to date. The concentrated clay zones are typically associated with zones of extremely weathered rock and an increase in the felsic mineral population and crystal size. In addition, pink alkali-feldspar was locally observed along fracture surfaces indicating possible hydrothermal alteration; however, other typical hydrothermal mineralization was not recognized. Calcite and, to a lesser extent, epidote mineralization was also recognized but at percentages less than expected for a calcium-rich parent rock. The apparent absence of calcite mineralization indicates that fluids have mobilized and removed calcium and associated mineralization.

The granitic rock (GR) was divided into four map units based on the degree of weathering, rock strength, and rock hardness. The four map units are identified on the geologic cross-sections by the symbols of GRw, GRt, GRm, and GR.

GRw: This map unit consists of granitic rock that primarily consists of extremely to highly weathered granitic rock that is very weak to weak, with low hardness and is locally friable. This map unit has a gradational upper contact with the residual soil and gradational to abrupt contact with the underlying map units.

GRt: This map unit is a transitional zone within the granitic rock becoming highly to moderately weathered, weak to moderately strong, and weak to moderately hard. However, zones of GRw are still prevalent locally and along individual fractures. This map unit has a strong correlation with observed and interpreted groundwater elevations and forms rims around core stones of higher quality rock.

GRm: This map unit consists primarily of moderately weathered rock that is moderately strong to strong, and moderately hard to hard. Localized zones are present that are slightly to moderately weathered. The unit is gradational with GRt and the underlying map unit GR.

GR: This map unit consists primarily of slightly weathered to fresh, strong to very strong, and hard granitic rock.

3.2 Granitic Rock Quality

The elevation ranges and average rock strength properties of the granitic rock map units are summarized in Table 4. Individual RQD values for each core run per individual boring and the average RQD values for each map unit per individual boring are presented in Appendix F. Individual laboratory test results from specific sample intervals per boring are presented in Appendix D.

TABLE 4
MAP UNIT ELEVATIONS AND PROPERTIES

Map Unit	Elevation Range		RQD		UW	CS	DS		Triaxial
	Top (ft-msl)	Bottom (ft-msl)	OC-borings (Average)	CB-borings (Average)	(pcf)	(psi)	Friction Angle (degree)	Cohesion (psf)	Sigma 1 (ksf)
GRw	963-878	923-848	53.4*	-	153.2	442.0	-	-	55.1
GRt	923-848	900-832	58.4*	-	151.9	465.0	-	-	-
GRm	910-832	895-826	68.2	42.7	161.9	2101.0	62	2640.8	85.9
GR	895-826	-	85.2	59.8	173.6	14445.0	-	-	414.3

*RQD recorded in poor quality rock to show relative degree of fracturing.

As shown in the above Table 4, there is a general increase in RQD, unit weight (UW), compressive strength (CS), and triaxial strength with depth as is typically expected. Only one direct shear test was successfully completed, the remaining test samples were terminated due to equipment capabilities. As shown by averaged results above, there is little difference between the map units GRw and GRt, however within individual borings there is more differentiation (Appendix F). Due to variation within these map units, reversals in rock quality trend and relative vertical positioning occur. This can be attributed to the localized presence of core stones, localized shearing, grain size reduction, and associated increase in degree of weathering.

The application of RQD to highly weathered rocks is not applicable and, therefore, the overall rock quality of map units GRw and GRt is considered poor. However, based on fracture frequency, and the localized presence of core stones, the average rock quality of map units GRw and GRt would rate as fair. The rock quality for the map units GRm and GR classify as fair and good respectively.

As shown on the geologic cross-sections (Figures 2 through 7), the overall vertical distribution of these map units is the same as listed in Table 4 above.

3.3 Groundwater

Groundwater elevations presented on the geologic cross-sections (Figures 2 through 7) were based on earlier reported elevations that were recorded during the drilling of the CB-borings and observations from the air-track borings. Groundwater was not observed in any of the recent OC-borings that were advanced with drilling mud from the surface to total depth. However, none of the OC-borings were observed to have an influx of water during drilling.

The groundwater elevations were correlated from section to section and ranged in elevation from approximately 864 feet above mean sea level (msl) to approximately 882 feet msl, with a typical elevation of approximately 877 feet msl. These elevations are consistent with elevations of approximately 870 to 872 feet msl that were recently reported from the temporary monitoring wells installed in the western portion of the site within the water tank area.

In addition, there is a strong correlation of the observed and interpreted groundwater elevations within the map unit GRt, which is a relatively thin map unit separating the extremely to highly weathered rock above (GRw) from the moderately and slightly weathered rock below (GRm). A general observation is that extensive weathering and clay infilled fractures were associated with the map units GRw and GRt, and only a few fractures with clay were observed in the underlying map units, particularly map unit GR.

4.0 ORIENTED CORE FRACTURE DATA

As mentioned above, GeoVision geophysical services performed Acoustic Televiewer surveys in each of the four OC-borings. A report of the survey data is presented in Appendix E. The surveys were performed with a HiRat Televiewer Probe that produces images of the boring walls based upon the amplitude and travel time of an ultrasonic beam that is reflected from the formation wall. Details

of the system and the quality control are included in the GeoVision report in Appendix E, as are the acoustic images for the borehole caliper log and simulated core images from the borehole wall. The Acoustic Televiewer images of the borehole wall collected the apparent dip angles of the fractures that were corrected to true dip accounting for the plunge of the boring and boring orientation. The fracture data collected reported the dip and dip azimuth in relation to true north. This data is presented on the Acoustic Televiewer logs, and in table and rose diagram formats (Appendix E). However, the Televiewer does not describe or image the fracture infillings or other fracture descriptors that are recoded from the actual core.

As noted in the GeoVision report, the simulated core image represents a core with a diameter of the borehole wall and does not represent the diameter of the actual core, so direct comparison is not considered possible. However, the fracture orientations collected from the Acoustic Televiewer were added to the geologic core logs at their corresponding depths. This allowed for comparison of the oriented fractures imaged by the Acoustic Televiewer with corresponding fracture descriptions of the logged core. Although a direct comparison cannot be made for every fracture, some reasonable correlations can be made between actual logged fractures with non-oriented dips and fracture descriptions with the oriented fracture data collected by the Televiewer. The oriented core boring logs (OC-1 through OC-4) are presented in Appendix B.

The imaged fracture data was plotted on Rose diagrams for each OC-boring. The Rose diagram plots the relative abundance of fractures with similar trends (joint sets). Based on the relative abundance of the identified imaged fractures, primary, secondary and tertiary level joints sets were identified from each Rose diagram. The advancement of the OC-borings in different orientations provided a greater opportunity to capture joint sets of differing orientation or of relative abundance of a particular joint at each boring location. Table 5 lists the dip azimuth, and corresponding strike and dip direction by quadrant of the identified joint sets. Actual dip measurement in degrees is not accounted for in the Rose diagram plots; however, the range of dip angles for a particular joint set was collected from the tabulated data and is also presented in the following Table 5.

TABLE 5
ROSE DIAGRAM FRACTURE SUMMARY FOR INDIVIDUAL OC-BORINGS

	Joint Set Level of Abundance		Dip Azimuth	Strike of Fracture Plane	Dip Direction by Quadrant	Range Joint Set Dip Angles (Range)	(Average)
OC-1	Primary	Set 1	310-320	N40-50E	NW	13-89	67
	Secondary	Set 1	300-310	N30-40E	NW	11-87	60
		Set 2	100-110	N10-20E	SE	7-69	43
		Set 3	140-150	N50-60E	SE	12-88	46
	Tertiary	Set 1	020-038	N70-52W	NW	38-85	53
		Set 2	051-060	N30-39W	NE	65-75	64
		Set 3	210-218	N60-52W	SW	18-47	26
OC-2	Primary	Set 1	010-020	N60-70W	NE	34-85	59
		Set2	350-360	N80W-EW	NE	53-89	75
	Secondary	Set 1	020-030	N50-60W	NE	41-74	58
		Set2	030-040	N40-50W	NE	57-77	70
	Tertiary	Set 1	320-330	N50-60E	NW	27-77	34
OC-3	Primary	Set 1	300-310	N50-60E	NW	13-60	29
		Set2	250-260	N10-20W	SW	15-35	23
		Set 3	130-140	N40-50E	SE	42-75	64
	Secondary	Set 1	310-330	N40-60E	NW	26-67	40
	Tertiary	Set 1	070-080	N10-20W	NE	47-75	56
		Set 2	150-160	N60-70E	SE	42-79	54
		Set 3	180-190	N80W-EW	SW	27-84	54
OC-4	Primary	Set 1	190-200	N70-80W	SW	31-74	52
	Secondary	Set 1	120-130	N30-40E	SE	12-62	42
	Tertiary	Set 1	210-220	N50-60W	SW	37-85	59
	Tertiary	Set 2	050-060	N30-40W	NE	25-49	38

The primary, secondary, and tertiary joint sets chosen from Rose diagrams for the individual OC-borings do not account for all of the joints identified, and represent approximately 58 percent of the fractures in each boring. This reflects the relatively small data set and the remaining fractures represent a scatter of fracture orientations. In addition, the grouping of joint orientations also influenced which orientation was considered as a primary, secondary, or tertiary joint set. Therefore, we compared the findings from the individual borings to the combined number of fractures from all the OC borings. The joint sets identified from the combined data set accounted for approximately 80% of all the identified fractures, and the remaining 20% of the fractures fell between the chosen joint groupings, and are therefore indirectly accounted for. The grouping of

fracture orientations was based on features within 10 degrees of each other. Changes in orientation of two degrees or more between consecutive joint orientations constituted the start of a new grouping of fracture orientations. The following Table 6 presents the primary, secondary and tertiary joint sets that were identified from the combined fracture data from all the borings.

TABLE 6
ROSE DIAGRAM FRACTURE SUMMARY FOR ALL OC-BORINGS

Joint Set Level of Abundance		Dip Azimuth	Strike of Fracture Plane	Dip Direction by Quadrant	Range Joint Set Dip Angles (Range)	(Average)
Primary	Set 1	N298-310	N28-40E	NW	13-89	45
	Set 2	N312-320	N48-58E	NW	13-76	58
	Set 3	N351-360	N81E,EW	N-NW	25-86	70
	Set 4	N022-030	N60-68W	NE	13-89	49
	Set 5	N011-020	N70-79W	NE	34-86	70
	Set 6	N189-198	N81-72W	SE	14-74	40
Secondary	Set 1	N103-110	N13-20E	SE	7-82	44
	Set 2	N120-130	N30-40E	SE	20-81	57
	Set 3	N137-148	N47-58E	SE	21-88	54
	Set 4	N036-047	N43-54W	NE	33-77	54
	Set 5	N324-334	N54-64E	NW	12-67	37
Tertiary	Set 1	N091-100	N1-10E	SE	40-88	62
	Set 2	N272-282	N2-12E	NW	15-69	45
	Set 3	N177-187	N83-87E	S	22-84	65
	Set 4	N250-261	N11-20W	SW	15-50	27
	Set 5	N067-076	N12-23W	NE	17-80	52
	Set 6	N216-226	N44-54W	SW	8-60	31
	Set 7	N202-210	N60-68W	SW	21-85	38
	Set 8	N001-010	N80-89W	NE	3-83	59

The logged borings identified approximately 32 percent more fractures than the amount identified by the Acoustic Televiewer. Some of this difference can be attributed to mechanical fracturing that developed as a result of the drilling and logging process. Due to the extensive weathering of the rock mass, mechanical fractures had infillings that were similar to those of the fractures that were clearly not mechanical. This suggests that many tight and incipient fractures or parting surfaces are present throughout the rock mass. This was further substantiated during subsequent handling of the rock and standard field testing to identify degree of weathering, relative rock strength, and hardness. The rock within map units GRw, GRt, and to a lesser extent in GRm, typically broke along planes paralleling existing fracture orientations within the rock. Rock fabric such as foliations and banding

that could be attributed to the additional fracturing that was produced during handling was not visibly recognized. The Televiewer could not log the cased portions of the borehole, or the bottom of the boring below the sensors, which also caused the Televiewer to record a lower percentage of fractures.

The following Table 7 compares the fracture frequency over each weathered granitic rock map interval between the logged cores and those imaged by the Televiewer. As shown in the table, there is a fair correlation of the amount of fractures over the specified intervals. However, as shown on the OC-core logs in Appendix B, one for one correlation between the fracture data sets is interpretive.

TABLE 7
FRACTURE FREQUENCY COMPARISION

Acoustic Televiewer				Logged Core			
Boring ID	Drill Length Interval	Fractures per Foot	Rock Type	Boring ID	Drill Length Interval	Fractures per Foot	Rock Type
OC-1	8-26	0.9	GRw	OC-1	3-26	0.9	GRw
	26-43	1.1	GRt		26-43	1.9	GRt
	43-63	0.9	GRm		43-63	1.9	GRm
	63-80	2.1	GR		63-84	1.5	GR
OC-2	1-43	1.0	GRw	OC-2	1-43	1.1	GRw
	43-54	0.8	GRt		43-54	1.7	GRt
	54-66	1.0	GRm		54-66	1.7	GRm
	66-82	0.9	GR		66-84	1.0	GR
OC-3	1-44	0.7	GRw	OC-3	1-44	0.9	GRw
	44-58	0.7	GRt		44-58	1.0	GRt
	58-82	0.4	GRm		58-82	1.0	GRm
	82-94	1.3	GRt		82-94	1.4	GRt
	94-108	1.3	GRm		94-108	1.6	GRm
	108-111	1.0	GR		108-113	0.5	GR
OC-4	1-33	0.3	GRw	OC-4	1-33	0.9	GRw
	33-62	0.4	GRw(GRt)		33-62	0.8	GRw(GRt)
	62-70	0.4	GRw		62-70	0.6	GRw
	70-74	0.3	GRt		70-74	1.0	GRt
	74-84	1.3	GRm		74-86	1.5	GRm

Based on the above comparison of the logged fractures and the fractures imaged by the acoustic Televiewer, plus the fracture frequency from the field line joint survey, the average fracture frequency is approximately one fracture per foot.

5.0 DISCUSSION

Granitic rock zones were recognized during drilling and field mapping that consisted of extremely weathered and highly oxidized rock with joints filled with a white unknown greasy, non-plastic clay material that was interpreted to be "kaolinitic" clay. Typically the clay expressed slickenside lineations, which indicate that shearing occurred along the surfaces. The recognized weathered zones are listed in the following Table 8. The recognized zones appear to fall into two roughly defined elevation levels, with an upper zone ranging from approximate elevations of 924 to 934 msl and a lower group within an approximate elevation range from 866 to 894 msl. Tentative correlations of the sheared weathered zones could be made between individual core borings, but variation in dips and dip direction made it difficult to correlate these zones as continuous shear planes that are laterally continuous across the site. However, the roughly similar elevations of zones suggest the possibility of some degree of lateral continuity. Therefore, field mapping should be continued, to verify whether these zones are laterally continuous features or individual isolated zones. The following Table 8 lists the zones that were recognized in each boring. The shear orientations listed for each zone are interpreted from the recognized Acoustic Televiewer fracture orientations that fall within the logged zones and best match the dips of the logged fractures that are infilled with kaolinite clay material.

TABLE 8
SUMMARY OF EXTREMELY WEATHERED SHEARED ZONES

Boring ID	Zone	Drill Length Interval (Feet)	Approximate Thickness (Feet)	Elevation (msl)	Shear Orientation (dip-azimuth)	Dip Direction (Quadrant)
OC-1	1	40	1	888	12@331	NW
					53@033	NE
	2	63-64	1	868	69@100	SE
OC-2	1	0-30	30	934-907	19@256	SW
					37@227	SW
OC-3	1	26-29	4	938-935	20@275	W-NW
	2	37-40	3	927-924	15@282	W-NW

TABLE 8
SUMMARY OF EXTREMELY WEATHERED SHEARED ZONES

Boring ID	Zone	Drill Length	Approximate Thickness	Elevation (msl)	Shear Orientation	Dip Direction

		Interval (Feet)	(Feet)		(dip-azimuth)	(Quadrant)
					30@303	W-NW
	3	66-69	3	897-894	27@187	SW
					31@210	SW
	4	81-92	11	885-874	19@221	SW
					28@225	SW
	5	94-95	1	870	20@196	SE
					40@023	NE
OC-4	1	21-22.5	1.5	924-925.5	79@348	NW
	2	46-52.8	7	900-893	39@050	NE
					56@114	SE
	3	62-67	5	885-880	31@194	SW
	4	78-81	3	870-867	51@237	SW
					26@053	NE
					37@073	NE
CB-3	1	72-73	1	887	-	-
	2	77	1	882		
CB-4	1	80-85	5	885-880	-	-
	2	90-94	4	875-871	-	-
CB-5	1	54-55	1	891	-	-
					-	-
CB-6	1	64-74	10	876-866	-	-

The above listed weathered and sheared zones only represent those recognized from the core logs and the joint line survey. Other zones that have not been identified could also exist.

6.0 CONCLUSIONS

Based on the additional core borings and the re-logging of the previously completed combined hollow stem and core borings, the majority of the proposed excavation will be within the granitic rock map units GRw and GRt that are typically poor to fair in rock quality. This is consistent with the earlier interpretations of the rock mass. Recognized fractures were found to consist primarily of

narrow to very narrow joints with spotty iron-oxide stained, slightly rough planar surfaces. Kaolinitic clay material was found filling some jointed surfaces that were occasionally slickensided.

Oriented fracture data was divided into primary, secondary, and tertiary fracture sets based on the abundance of fracture orientations. Six primary joints sets, five secondary joint sets, and eight tertiary joint sets accounted for approximately 80% of the fracture orientations. The primary or most abundant joint sets appear to fall into three general ranges that trend from approximately N30-60E, N60-80W, and essentially east-west varying between N80E to N80W. Based on the field joint line survey, the fracture spacing of the primary joint sets is within the five to ten feet range, with zones within the two to five feet range.

Comparison of the entire fracture population from the Acoustic Televiewer imaged fractures and the logged core indicate that the fracture frequency was approximately one fracture per foot. However, a higher fracture frequency is indicated for the poorly weathered rock units GRw and GRt that readily break along tight parting surfaces and incipient fractures and/or fractures that have been obscured by the high degree of weathering.

As a result, the rock mass within the map units GRw and Grt typically breaks down to fine to coarse grained sand during excavation with the exception of localized core stones or areas of less weathered stronger rock. Observations of the temporary cut faces in these rock types reveals that rock faces consist of granitic rock material bounded by fractures resulting in blocks that are approximately one to two feet in diameter that can be broken by hand down to sand sized particles. As shown on the cross-sections, the majority of the proposed excavation will consist of this type of material. However, some core stones and less well-defined areas of GRm and GR type material have been encountered and should be expected, particularly at elevations below approximately 890 feet msl.

Zones of highly to extremely weathered, oxidized, weak rock with prevalent Kaolinitic clay filled joints to shears were identified across the site, and although a laterally continuous sheared surface was not correlated across the site, the weathered/sheared zones do appear to be concentrated within elevation ranges of approximately 924 to 934 feet msl and 866 to 894 feet msl. Based on correlations of the Acoustic Televiewer fracture orientations with the core logs, it appears that these zones are both shallow dipping features in the 20 to 30 degree range, and steeply dipping features in the 60 to 70 degree range. It is possible that the two elevation ranges of weathered/sheared zones are structurally associated by the steeply dipping features.

7.0 RECOMMENDATIONS

We recommend the excavation be continually mapped during the installation of the soil nail walls to identify if any continuous sheared surfaces may be present, and to identify any joint bounded blocks of rock that are unstable on the soil nail lift excavation faces. Small unstable blocks of rock should be expected and removed from the rock face. Rock bolts could be necessary and should be available and installed on as-needed bases for larger blocks of rock or core stones when or if encountered. Any void space created by small unstable and removed blocks should be filled with structural shotcrete during wall face construction.

The present soil nail design accounts for conservative estimates of rock strength. However, the extremely weathered shears zones with kaolinite clay filled fractures will have substantially lower strength parameters and long term apparent cohesion near zero. Additional testing of these materials should be performed as the excavation progresses. Moreover, CTE personnel are continuing to observe and map the excavation and further confirm the continuity of fractures and location of local weaker materials. Additional recommendations could be required based on the continued site excavation and actual conditions encountered.

8.0 LIABILITY STATEMENT

Our conclusions and recommendations are based on an analysis of the observed conditions. Conditions different from those described herein could be encountered. Therefore, field observations and mapping during excavation and soil nail installations are critical. In addition, our office should be notified and additional recommendations, if required, will be provided upon request, should differing conditions be encountered. As indicated, it is critical that CTE evaluate the exposed field conditions during excavation and soil nail wall construction and should review the final design and detailing of all retaining walls.

We appreciate the opportunity to be of service on this project. Please contact our office should you have additional questions or comments.

Respectfully submitted,

CONSTRUCTION TESTING & ENGINEERING, INC.

Dan T. Math, GE #2665
Principal Engineer

Martin E. Siem CEG #2311
Senior Engineering Geologist

MES/JFL/DTM:nri

APPENDIX 5

CITY OF SAN DIEGO:

TRUCKED WASTE REQUIREMENTS AND PROCEDURES

TRUCKED WASTE REQUIREMENTS AND PROCEDURES

This document establishes the location, schedule, procedures, fees, and other conditions under which trucked domestic and industrial wastes will be permitted for discharge into the San Diego public sewer. Discharges to public or private sewer connections not described in this document are prohibited, unless specifically authorized, in writing, by the Industrial Wastewater Control Program (IWCP) or other designee of the City Manager. The Industrial Wastewater Control Program issues three types of trucked waste permits: Trucked Domestic Waste Hauler Permits, Trucked Industrial Waste Generator Permits, and Trucked Industrial Waste Hauler Permits. Definitions, policies, and limitations pertaining individually to these three types of permits are defined in sections A-C; general provisions are defined in sections D-J. All requirements set forth herein are incorporated into each trucked waste permit by reference. Failure on the part of the permittee to fulfill any of the requirements or conditions set forth herein shall be sufficient cause for immediate revocation of the applicable trucked waste permit. Any assignment or transfer of the permit shall automatically make it void. Compliance with these requirements does not relieve the permittee from an obligation to comply with all applicable pretreatment regulations, standards, or requirements under Federal, State, or local laws, including any such regulations, standards, or requirements that become effective during the term of a trucked waste permit. The industrial user shall comply with applicable provisions of the Municipal Code pertaining to the sewer department and to the discharge of industrial wastes to the sewerage system.

Discharge Permit applications and Waste Hauler Permit applications can be obtained from:

Industrial Wastewater Control Program
9192 Topaz Way, M.S. 901D
Phone: (858) 654-4100
Fax: (858) 654-4110

Section A: TRUCKED DOMESTIC WASTE HAULER PERMITS

1) DEFINITION: Domestic Wastewater shall mean the liquid and water borne wastes derived from the ordinary living processes in a dwelling unit.

2) PERMIT REQUIRED: All truckers planning to discharge septic tank wastes, portable toilet wastes, or other domestic wastes into the San Diego public sewer must obtain a Trucked Domestic Waste Hauler Permit. Permits are issued to truckers for one year, and must be renewed annually by submitting an updated application. The Trucked Domestic Waste Hauler Permit application requires the following information:

   a) Identifying information about the firm (name, address, etc.)
   b) Name and phone number of contact person
   c) Status of operations with regard to industrial waste hauling activities
   d) A list of trucks which will be used to haul domestic waste, and associated identifying information including: make/model, year, tank capacity, license number, and submit a copy of the "Permit to Operate Septic Pumper Truck Operation", issued by the County of San Diego Department of Environmental Health, with a list of vehicles approved by the County, that will be used to discharge domestic wastewater.
   e) A statement certifying knowledge of the application contents, familiarity with the requirements and procedures set forth in this document, and compliance with the applicable regulations including the prohibition against discharge of hazardous waste.

3) WASTE VOUCHER REQUIRED: The permitted waste hauling firm is required to complete a Trucked Domestic Waste Voucher for each domestic pump-out event. The vouchers establish a record of responsibility for the compositions of discharges entering the sewerage system, in accordance with federal EPA requirements. Each voucher must be completed and signed by the trucker and then signed by the pump station operator or other representative of the Industrial Wastewater Control Program at the disposal site. Vouchers may not be altered once discharge has been initiated. The top copy of the form is left at the disposal site; the trucker retains the bottom copy. The voucher requires the following information:

   a) Permittee Name
   b) Permit Number
   c) Truck/Trailer License Number and State
   d) Estimated Pump-out volume, in gallons
   e) Waste Type (septic tank, portable toilet, etc.)
   f) Complete waste pickup address including City
   g) Customer Name and Phone Number
   h) Date of Pump-out and Date of Waste Disposal
   i) Waste hauler certification that the information contained in the voucher is true and correct

4) SCHEDULED ROUTES: A single Trucked Domestic Waste Voucher may be used when the entire load to be discharged is composed solely of portable toilet and/or sewage holding tank waste, provided that a unique route number/name is written on the voucher, and the waste hauler can, upon request, provide records showing the address or location of each toilet or tank pumped for that load.

5) MULTIPLE VOUCHER LOAD SUMMARY: In the case where multiple Domestic Waste Pump-outs are combined and discharged as a single truck load, and the Scheduled Route provision, above, doesn't apply, the waste hauler must also complete a Multiple Voucher Load Summary. The summary requires the following information:

a) Permittee Name
b) Permit Number
c) A list of individual pump-out volumes and corresponding voucher numbers for each source of waste combined in the truck.
d) The total volume of waste, in gallons, to be discharged as one truckload
e) The truck license number and state
f) Waste hauler certification that the information contained in the summary is true and correct and that no waste, other than those indicated, are contained within the load

6) AUTHORIZED DISCHARGES: The Trucked Domestic Waste Hauler Permit authorizes discharge of wastewater from:

a) Wastewater associated with sewer spill cleanups and sewer line maintenance (including lift station maintenance) when the sewage source is NOT connected to the Metropolitan Sewerage System. Please see section B (17) for information on permitting requirements for similar wastewater generated from sources that are connected to the Metropolitan Sewerage System. Questions regarding the Metropolitan Sewerage System service area may be directed to the Industrial Wastewater Control Program (858) 654-4100.
b) Pumping and cleaning of septic tanks and associated private leach lines, sewer lines, and sewage pumping equipment.
c) Pumping of sewage collection, holding, and transfer tanks (including marine vessel CHTs).
d) Portable Toilets.

7) The wastes to be discharged must have originated within San Diego County and must be of such character as to permit satisfactory disposal, without special treatment, into the public sewer.

8) RESTRICTIONS: The following Wastestreams may not be discharged to sewer under a Trucked Domestic Waste Hauler Permit:

a) Industrial wastes as defined in Section B (1).
b) Wastewater generated from the mechanical cleaning of CHTs.
c) Wastewater generated outside San Diego County
d) Wastewater which is of such character as to interfere with normal sewage treatment operations, cause pass through of pollutants, or otherwise adversely affect the Publicly Owned Treatment Works (POTW) or sewage collection system.
e) Wastewater which violates the general and specific prohibitions listed in Section B (6) and (7).
f) Wastewater/Sludge generated from domestic treatment plants, aeration basins, settling ponds, etc. These types of wastewater require a Trucked Industrial Waste Generator Permit and are approved on a case by case basis.

Section B: TRUCKED INDUSTRIAL WASTE GENERATOR PERMITS

1) DEFINITION: Industrial Wastewater shall mean all wastewater, excluding domestic wastewater, and shall include all wastewater from any manufacturing, processing, cleaning, institutional, commercial, service, agricultural, or other operation. Also included in the industrial category is wastewater from the mechanical, pressure, or chemical cleaning of domestic waste holding tanks (like CHTs on a ship) and storm drains, and wastewater generated by the centralized treatment of grease trap wastes or other pre-authorized centralized treatment operations. Certain sources previously classified as industrial wastewater, such as swimming

pools, sewer overflows, and water main breaks, are considered dilute industrial sources and are authorized for discharge under a Trucked Dilute Industrial Waste Generator Permit (see Section B (17)).

2) PERMIT REQUIRED: Anyone planning to discharge industrial wastes into the San Diego public sewer via a waste hauler must obtain a Trucked Industrial Waste Generator Permit. Trucked Industrial Waste Generator Permits are issued to the party responsible for arranging for legal disposal of the specific wastes (i.e., bilge water from a designated ship) and last only as long as the job requires, but in no case longer than one year. The permit application requires the following information:

   a) Identifying information about the firm (name, address, etc.)
   b) Name and phone number of the contact person
   c) Dates the waste will be discharged and an estimate of the volume of wastewater to be discharged
   d) Name of the firm contracted to haul the industrial waste (this firm must have a Trucked Industrial Waste Hauler Permit)
   e) Description of the waste to be discharged and any treatment methods employed
   f) Identification of applicable Federal Categorical Pretreatment Standards
   g) Identification of the laboratory performing the required initial analysis (see self monitoring requirements below)
   h) Permittee statement certifying accuracy of application contents, familiarity with the requirements and procedures, and compliance with applicable discharge standards including the prohibition against the discharge of hazardous waste

3) WASTE HAULER: The firm that provides trucks and hauls the waste must have a Trucked Industrial Waste Hauler Permit (see Section C). The designated waste hauler is required to carry a copy of the generator's permit on each truck that discharges at the pump station, therefore the generator must provide a copy of the job specific Trucked Industrial Waste Generator Permit to their contracted waste hauler. Discharge fees will be billed to the Waste Hauler.

4) MANIFEST REQUIRED: A properly completed Trucked Industrial Waste Manifest is required with each truckload of waste. The manifest establishes a record of responsibility for the composition of discharges entering the sewerage system, in accordance with federal EPA requirements. The holder of the Trucked Industrial Waste Generator Permit must complete the top section of the manifest at the time and place the waste load is picked up; the manifest must be signed in accordance with the signatory requirements established in Section H. Upon waste pick up, the contracted Industrial Waste Hauler is responsible for completion of the second section of the manifest. The pump station operator or other representative of the Industrial Wastewater Control Program at the disposal site must then sign the completed manifest form. The top copy of the form is left at the pump station; the trucker retains the middle copy, and the permittee retains the bottom copy. Manifests may not be altered once discharge has been initiated.

5) DISCHARGE LIMITATIONS: Unless the permit specifically states otherwise, all Industrial Wastewater to be discharged must have originated from the Metropolitan Sewerage System's service area. The waste discharged under the permit must not be mixed with any other permitted or un-permitted wastestream. Discharge of wastes not specifically authorized by the permit is strictly prohibited. Waste discharges must be made in compliance with all applicable local, state, and federal regulations including the following:

6) GENERAL PROHIBITION (from 40 CFR 403): A User may not introduce into a Publicly Owned Treatment Works (POTW) any pollutant(s) which cause Pass Through or Interference. These general prohibitions and the specific prohibitions in Section B (7) apply to each User introducing pollutants into a POTW whether or not the User is subject to other National Pretreatment Standards or any National, State, or local Pretreatment Requirements.

7) SPECIFIC PROHIBITIONS: In addition, a User may not introduce the following discharges into the Metropolitan Sewerage System:

   a) Flammable or Explosive Substances: Pollutants which create a fire or explosion hazard in the wastewater collection system or treatment plant, including but not limited to, wastestreams with a closed cup flashpoint of less than 140 degrees Fahrenheit (60 degrees Centigrade) using the test methods specified in 40 CFR 261.21;
   b) Corrosives: Pollutants which will cause corrosive structural damage to the POTW, but in no case discharges with pH lower than 5.0 or greater than 12.5 unless a specific variance is granted;
   c) Hazardous Wastes: Hazardous wastes, as defined in California Administrative Code, Title 22, Section 66261.3 or under the Federal Resource Conservation and Recovery Act (RCRA). RCRA and related state laws are administered by the County of San Diego Department of Health Services, Hazardous Materials Management Division (HMMD). Questions about whether a waste is considered "hazardous" may be referred to HMMD at (619 338-2222);
   d) Toxic and Poisonous Substances: Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in an quantity that may cause acute worker health and safety problems;
   e) Substances which may obstruct flow: Solid or viscous substances in amounts which will cause obstruction to flow in the sewer resulting in Interference;
   f) Odorous Wastes: Strongly odorous wastes or wastes tending to evolve strong odors;
   g) Uncontaminated Water: Uncontaminated ground, storm, and surface waters, and roof runoff;
   h) Pretreatment Sludges: Sludges or deposited solids resulting from an industrial or pretreatment process;
   i) Heat: Heated wastestreams having a temperature that is equal to or greater than one hundred and fifty (150) degrees Fahrenheit or sixty-five (65) degrees Centigrade;
   j) Radioactive Wastes: Radioactive wastes or isotopes of such half-life or concentrations as may exceed limits established in the Code of Federal Regulation at 10 CFR 20, Subpart K;
   k) Greases and Oils: Petroleum oil, non-biodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through.

8) Specific Limitations, Local: Each permit will specify which of the local limits, listed below, apply. The determination is based upon the nature of the operation generating the waste. The discharge of non-federally regulated wastes containing pollutants in excess of applicable local limits is prohibited. Some permits may establish additional limits based upon the nature of the waste (e.g. contaminated groundwater). Applicants should call the Industrial Wastewater Control Program for initial analysis requirements prior to applying for a permit. Dilution as a full or partial substitute for adequate pretreatment is prohibited.

Constituent	Units	Limit
Acids and Alkalis	pH	range 5-12.5
Oil and Grease	mg/l	500
Cadmium	mg/l	1
Chromium	mg/l	5
Copper	mg/l	11
Lead	mg/l	5
Nickel	mg/l	13
Zinc	mg/l	24

The Industrial Wastewater Control Program may also require that wastes be analyzed for Total Suspended Solids (TSS) and Chemical Oxygen Demand (COD) in order to determine if the wastes are subject to additional treatment fees (surcharge).

9) Specific Limitations, Categorical: Wastes originating from federally regulated processes must comply with the applicable categorical standards; see 40 CFR Parts 403 through 471. Dilution as a full or partial substitute for adequate pretreatment is prohibited. Industrial users proposing to discharge federally regulated wastestreams will be required to provide process and flow information necessary to apply the Combined Wastestream Formula, as established in 40 CFR Part 403.6.

10) SELF MONITORING REQUIREMENTS

a) Initial Self-Monitoring Event: Before obtaining a Trucked Industrial Waste Generator Permit, the applicant is required to have a representative sample of the wastewater analyzed for specific constituents. Check with the Industrial Wastewater Control Program to find out which constituents are required. A copy of the laboratory analysis and a completed "Industrial Trucked Waste Lab Analysis Report Certification" must be submitted with the permit application.

b) Monthly Self-Monitoring Required: Trucked Industrial Waste Generator permittees must submit monthly (or, at the discretion of the program, more or less frequent) chemical analyses of the wastewater they are hauling for every permit lasting more than 45 days. Results for the monthly monitoring period are due the 15th of the following month.

c) Self-Monitoring Form: Self-monitoring analysis results must be submitted on the self-monitoring form (SMF) which will be mailed to the permittee approximately four weeks prior to the due date. Transfer analysis results to the reporting form, converting units, if necessary, to match those on the form, and return it to this office no later than the due date, together with a copy of the original laboratory analysis report. A SMF due on the 15th of one month must contain analysis results from a discharge that occurred during the previous month. The sampling and analysis may be done at any time within the monitoring period. After the permitted job is completed, you will receive a final SMF, due the 15th of the month after completion. You are required to submit analysis results for a discharge that occurred during the last month of the job, so plan ahead. If you receive an SMF and you had NO DISCHARGES during the month, RETURN THE SMF with a signed statement saying that there were no discharges for the month in question. If you do not receive a SMF by the 15th of the month, call the Compliance Section, at 858-654-4100, for instructions on how to proceed. The SMF should be completed as follows:

i) **SAMPLING LOCATION**: samples collected for the purposes of this permit shall be representative of the volume and nature of the normal discharge. In the case of hauled wastewater, representative samples can usually be obtained by either collecting a sample of the wastewater being loaded into the clean hauling vehicle or from the hauling vehicle itself, via the top hatch.
ii) **SAMPLE TYPE:** listed on the SMF as GRABX1. GRABX1 requires that an individual sample be collected over a period of time not exceeding 15 minutes. This is most often accomplished by dipping a sample out of the waste stream with a bailer. All samples collected for the purposes of this permit shall be representative of the volume and nature of the normal discharge.
iii) **OTHER:** Enter all information requested in the blanks provided including:
iv) Sampler: Name of the person(s) who collect the sample
v) Sample Date: The date(s) over which the sample is collected
vi) Sample Time(s): The time at which the sample is collected
vii) Sample Description: The appearance of the sample. Indicate color, clarity, layering (if present), etc. Example: clear and colorless.
viii) Laboratory Name: The name of the lab that performed the analysis; a copy of the laboratory's report must accompany the ISMF.
ix) The attached Self Monitoring Report Certification must be signed and dated by the person with the authority to assure its validity. See section H for signatory requirements.

11) ANALYTICAL METHODS TO DEMONSTRATE CONTINUED COMPLIANCE: All handling, preservation, and laboratory analyses of samples shall be performed in accordance with 40 CFR Part 136 and amendments thereto, unless specified otherwise in the monitoring conditions of the permit, and all analyses must be conducted by an ELAP certified laboratory.

12) RECORD CONTENTS: The industrial user shall maintain accurate records of all monitoring activities, including: a) the date, exact location, method, and time of sampling, and the names of the person or persons taking such samples; b) the date analyses were performed; c) name of person(s) performing such analyses; d) the analytical techniques/ methods used; e) the results of those analyses; and f) the actual date(s) of discharge, when different from the sampling date.

13) ADDITIONAL MONITORING BY THE PERMITTEE: If the permittee monitors any pollutant more frequently than required by this permit, using test procedures prescribed in 40 CFR Part 136 or amendments thereto, or otherwise approved by EPA or as specified in this permit, the analyses results of such monitoring shall be submitted with the next scheduled self-monitoring report and included in any calculations of monthly average pollutant discharge.

14) SPLIT SAMPLES: The permittee has the option of requesting a split sample every time the Industrial Wastewater Control Program performs sampling. Should the permittee desire split samples, the following protocol must be observed:
   a) Permittees must request split samples at the time they are informed that their waste will be sampled. Alternatively, the permittee may write "Split Sample Requested" along the top margin of the manifest before submitting it to the technician for review.
   b) Permittees must provide their own sampling bottles and must have their sampling bottles ready to accept samples at the time the Technician performs the sampling for the Industrial Wastewater Control Program. Should the permittee request a split sample, but fail to provide sample bottles, the technician will proceed with sampling without providing the requested split.
   c) The waste hauler is responsible for ensuring that the correct sample bottles and sample preservation methods are employed.

15) **AUTOMATIC RESAMPLING: If sampling performed by an Industrial User indicates a violation, the User shall:**
   a) Notify the IWCP Compliance Supervisor (phone (858) 654-4100/ FAX (858) 654-4110) of the violation within 24 hours of becoming aware of the violation; and,
   b) Repeat the sampling and analysis for all characteristics or pollutants required by this permit at the sample point in violation, and submit the results of to the IWCP Compliance Supervisor within 30 days of becoming aware of the violation. This requirement is in addition to routine self-monitoring and therefore the results can not be used for the next report.

16) REPORTING OF RESULTS: The results of analyses shall be submitted on Industrial Self-Monitoring report forms, which will be provided, to:

Compliance Supervisor
Industrial Wastewater Control Program
9192 Topaz Way
San Diego, CA 92123—1119

17) TRUCKED DILUTE INDUSTRIAL WASTE GENERATOR PERMIT: Certain types of dilute wastewater are authorized for discharge under a Trucked Dilute Industrial Waste Generator Permit with modified permit requirements and discharge limitations. Permits for these general waste types are issued on an annual basis,

are not job specific, and do not require routine self-monitoring. Applicants must designate a permitted industrial waste hauler, however, it is recognized that in many cases, the generator will also be the permitted hauler. Wastewater generated from the following sources is authorized under a permit for dilute industrial wastestreams:

a) Swimming pools and decorative ponds
b) Water main break cleanups
c) Sewer spill cleanups and sewer line maintenance (including lift station maintenance) provided the source of wastewater is connected to the Metropolitan Sewerage System. Please see section a (6) for information on permitting requirements for similar wastewater generated from sources NOT connected to the Metropolitan Sewerage System. Questions regarding the Metropolitan Sewerage System service area may be directed to Industrial Wastewater Control Program (858) 654-4100.
d) Stormwater and other dilute waste sources not listed above, but NOT including storm drain cleaning (see Section B(1)): **These wastestreams must be authorized on a job-site basis, in writing, by the Industrial Wastewater Control Program**. A Trucked Waste Non-routine Discharge Authorization Request form is available from the IWCP for this purpose.

Wastewater authorized under the Trucked Dilute Industrial Waste Generator Permit may also be combined with domestic wastewater. However, mixing these dilute waste types with domestic wastewater, in any proportion, requires the combined waste to be discharged under a domestic permit and the entire load will be charged the domestic waste discharge rate. Each source of waste must be tracked using a Domestic Waste Voucher (See Section A.2) and summarized using a Multiple Voucher Load Summary (See Section A.4). All discharges are subject to the General and Specific Prohibitions set forth in Sections B (6) and (7).

Section C: TRUCKED INDUSTRIAL WASTE HAULER PERMITS

1) DEFINITION: Industrial Waste Hauler shall mean the owner or operator of any truck hauling industrial wastewater, as defined in section B.1, for disposal into the Metropolitan Sewerage System.

2) PERMIT REQUIRED: Industrial Waste Haulers must apply for and obtain a Trucked Industrial Waste Hauler Permit annually. The hauler permit application requires the following information:
   a) Identifying information about the hauling firm
   b) Name of contact person and phone number
   c) A list of trucks that will be used to haul industrial wastes including: make/model, year, tank capacity, and license number
   d) Permittee statement certifying the accuracy of application contents, familiarity with the requirements and procedures, and that a clean truck has been provided and that no waste mixing of wastes has been performed.

3) COPY OF THE CLIENT'S JOB SPECIFIC TRUCKED INDUSTRIAL WASTE GENERATOR PERMIT REQUIRED: The waste hauler must have a copy of the generator's Trucked Industrial Waste Generator Permit in their vehicle when discharging. To obtain access to the trucked liquid waste disposal point, both the hauler permit and the discharge permit must be made available to the pump station attendant upon request.

4) MANIFEST REQUIRED: For each waste load, the waste hauler must obtain a signed Trucked Industrial Waste Manifest from the waste generator. The firm holding the Trucked Industrial or Dilute Industrial Waste Generator Permit is responsible for filling out the top section of the manifest; the waste hauler is responsible for filling out the second section of the manifest. A completed manifest is required for each load of wastewater to be discharged. Manifests may not be altered once discharge has been initiated.

5) RESTRICTIONS: The following restrictions pertain to permitted Industrial Waste Haulers:
   a) The hauler must provide a clean truck for each job
   b) The hauler shall not mix the waste covered under one permit with any other permitted or unpermitted waste
   c) The hauler may not treat, dilute, or in any other way alter the characteristics of the waste

GENERAL PROVISIONS

Section D: DISCHARGE LOCATION AND SCHEDULE

The Trucked Waste Permit allows for Discharges at the following location and times only:

Pump Station #1
3350 East Harbor Drive
San Diego, CA

(619) 533-4647 (Trucked Waste Trailer)
(619) 533-4635 (Pump Station)

Monday-Saturday, 5:00 am-5:00 pm

CLOSED CITY HOLIDAYS: Memorial Day, Thanksgiving Day, Independence Day, Christmas Day, Labor Day, and New Years Day

Holders of Trucked Waste Permits are not guaranteed access to the City's dumping facility. Failure to comply with any of the provision listed in this document is cause to restrict or deny access to the dump station.

The permit does not authorize the discharge of wastewater to any other public or privately owned manhole. Further, the discharge of any treated or untreated wastewater from waste hauling trucks into sewer cleanouts, sinks, grease traps, interceptors, clarifiers, sumps, or other connection to the City sewer is strictly prohibited unless specifically authorized, in writing, by the City Manager or his designee.

1) The use of the above disposal location shall be limited to the specified times. If the entrance gate to the location is closed, the trucker must press the intercom button located near the gate. This will call the operator to open the gate. The City may, at any time, restrict or deny access to the discharge point for maintenance and repair and safety reasons.

2) Prearranged After Hours Discharges: Subject to approval, waste hauler firms may arrange to dispose of permitted wastes outside of the regular waste acceptance hours. Firms desiring to discharge outside of the above listed waste acceptance hours must submit a "Prearranged After Hours Pump Station Access Request" to the Industrial Waste Permits Office at least 24 hours prior to the intended time of discharge and no later than noon on Friday for requests to discharge outside of regular hours from Saturday evening through 6:00 am Tuesday morning. The Industrial Wastewater Control Program will return the request marked "Approved" or "Denied". Firms discharging outside of normal waste acceptance hours must complete the "After Hours Discharge Log" located in the Pump Station Operator's Office, and must provide a completed manifest/voucher for each load of waste discharged. The discharge of wastes outside of normal waste acceptance hours is subject to additional fees; see Section F.

3) Emergency Access (Applies to domestic wastes or wastes already authorized under a current Trucked Industrial or Dilute Industrial Waste Generator Permit): An emergency is defined as a threat to public health and welfare, or any instance where environmental harm or significant property damage is threatened. In such

instances, the waste hauler firm may gain access to the discharge point by calling the Station Operator, as much in advance as possible, at the above numbers. Prior to discharging, the waste hauler will be required to complete an "Emergency After Hours Pump Station Access Information" form which provides the Industrial Wastewater Control Program information about the nature of the emergency and the origin of the load. The waste hauler is required to complete the "After Hours Discharge Log" located in the Pump Station Operator's Office and to provide a completed manifest/voucher for each load. The discharge of wastes outside of normal waste acceptance hours is subject to additional fees; see Section F.

Section E: DISCHARGE PROCEDURE

The following procedure must be followed when disposing of wastes at the discharge location:

1) A copy of the appropriate discharge permit must be carried on each vehicle proposing to discharge into the public sewer. This copy must be shown to the Station Operator or Industrial Waste personnel, if requested. **NO DISCHARGE WILL BE ALLOWED WITHOUT A VALID TRUCKED WASTE HAULER PERMIT.** Additionally, Industrial Trucked Waste Haulers must keep a copy of the Trucked Industrial or Dilute Industrial Generator's Permit on board their vehicle. Permits are not available at the pump station.

2) **BEFORE** connecting the discharge hose and before discharging any wastes into the dumping manhole, all truckers must obtain the signature of the Station Operator or an Industrial Wastewater Control Program Lab Sampler on the manifest/voucher. The top copy of the signed manifest/voucher must be left in the Industrial Waste Trailer or Pump Station office. If both the Industrial Waste Laboratory Technician and Pump Station Operator are unavailable, the waste hauler must follow the posted "Unattended Log-In Procedure".

3) Generally, all discharges made during open hours will be logged into a computer database by the technician on duty. Should the waste discharge occur during unattended periods, or during a period when the computer system is non-functional, or at the direction of the technician, the waste hauler must complete the Trucked Waste Disposal Log found in the station office. The log must be filled out completely and legibly. Incomplete or illegible entries will result in a violation. The following information is required:

   a) Date
   b) Company or Ship Generating the Waste
   c) Permit Number
   d) Manifest/Voucher Number
   e) Vehicle or Trailer License Number
   f) Permitted Trucking Firm
   g) License State
   h) Driver's Full Name
   i) Time

   During unattended events, the waste hauler must stamp the date and time of discharge on the voucher or manifest. It is the program's intent to provide a date/time stamp for use during unattended discharges. If the time stamp is not available or inoperable, the driver should LEGIBLY print the date and time of discharge on the top portion of the manifest or voucher.

4) The waste hauler must allow Industrial Wastewater Control Program personnel to take a sample of the wastewater and must provide any assistance necessary. Industrial Wastewater Control Program personnel may require that a trucker wait to discharge a load of wastewater until an analysis or screening is completed.

The Industrial Waste Laboratory regularly obtains samples of trucked wastes in order to confirm compliance with discharge standards.

5) The discharge must be made through a hose inserted into one of the two manholes designated for hauled waste disposal or any other location as directed by the Station Operator. Trucks must be parked in such a manner as to allow other truckers full access to the adjacent manhole at all times. To ensure access for other customers, truckers shall leave the pump station facility immediately after discharge (and washout, if applicable) is complete.

6) The trucker is responsible for cleaning up any spilled waste on Pump Station property and for keeping the area around the disposal manhole clean. A hose is provided for cleaning the area around the dumping manhole; however, truckers are responsible for providing spill clean up equipment needed for spills made elsewhere on the property. The waste hauler must replace any manhole lids removed and leave the area as it was found.

7) As a courtesy, trucked waste haulers may use the Pump Station area wash down hose for tank wash out; the time allowed for tank wash out is limited to a maximum of ten minutes. The City expects that all dischargers will use the least amount of time possible, as a courtesy to fellow haulers, therefore this policy should not be interpreted to mean that for all waste loads, a full ten-minute wash out is authorized. This privilege may be suspended for reasonable cause, either generally, or for a particular waste hauling firm, at the will of the City, with twenty-four hour written notification.

8) The transfer and consolidation of domestic sewage between vehicles at Pump Station #1 is prohibited. Furthermore, conducting such activities outside of Pump Station #1 is discouraged since any spill or release of wastewater into the Storm Water Conveyance System (such as roads with drainage systems, municipal streets, catch basins, canyons, curbs, gutters, ditches, or storm drains) is a violation of the San Diego Municipal Code (Chapter 4 Article 3 Division 3 Section 43.0304) and may result in cleanup fees and penalties.

9) Disorderly or offensive conduct, including but not limited to verbal abuse or threats to City employees, is prohibited.

10) Trucked waste haulers must not park their vehicles in such a manner as to block or restrict access to the entry gate. Trucks may not park in the pump station driveway or on any of the stripe-painted areas within the pump station grounds.

11) The trucker must oversee the entire discharge event. Should the manhole become clogged or overflow, the discharge must be stopped immediately and the pump station attendant notified.

12) To prevent discharge hoses from falling into the discharge manhole, hoses smaller than 6" in diameter must be securely tethered to the dumping vehicle for the entire duration of the discharge event and during the connection and disconnection of the discharge hose from the dumping vehicle. Alternatively, waste haulers may utilize another method of preventing the hose from falling into the discharge manhole, as long as they have received prior written authorization for use of the alternative method from the Industrial Wastewater Control Program. Failure to use a tethered hose, or an approved alternative prevention method, will result in the issuance of a discharge denial and a notice of violation. Should the discharge hose fall into the manhole, the hauler is required to notify the pump station attendant immediately. The responsible company is liable for costs associated with repair of equipment damaged by dropped hoses.

13) To prevent damage or injury caused by rolling vehicles, parking brakes, and as applicable, air brakes must be engaged any time the driver exits their truck. Drivers of vehicles not equipped with fail-safe air brakes (e.g.

Maxi Brakes) are required to use chock blocks anytime the driver leaves the vehicle parked or stopped on Pump Station property. At the dumping manhole, the chock block should be placed firmly against the tire tread the side facing the trailers; at all other times, the chock block must be placed firmly against the tire on the downhill side. Waste hauler firms are responsible for making sure that each vehicle needing a chock block is equipped with one, and that drivers are properly trained in its use.

14) Truckers whose loads cannot be authorized for discharge due to failure to comply with these procedures or whose waste fails IWL screening criteria and/or truckers who are issued a discharge denial, must leave the pump station facility immediately.

To ensure the safety and security of customers, employees, and City property and to allow maintenance or repair activities, the City reserves the right to alter the discharge procedure at any time. In addition to these policies and procedures, trucked waste haulers are required to comply with posted signs and City employee instructions while within the Pump Station Facility.

Section F: FEES

1) Permit Fee: A $25.00 permit fee is charged for each permit or permit renewal. Permit fees are billed separately, by mail, to the permittee.

2) Discharge Fee: A disposal and treatment fee based on discharge category and hauler truck capacity is billed monthly, by job. While fees are billed per 1,000 gallons of capacity, they have been calculated and adjusted downward to reflect the program's assumption that the majority of trucks are only 90% full. Discharge fees are billed to the waste hauler.

   a) Normal Waste Fees: Please refer to the current Trucked Waste Rate Table for applicable domestic and industrial discharge fees.
   b) http://www.sandiego.gov/mwwd/environment/iwcp/pdf/truckedwastetable.pdf. Special Waste Fees: Certain wastes, such as wastes containing high levels of suspended solids, are subject to additional sewer charges. The permittee will be notified that an additional charge is applicable prior to issuance of a permit.

3) After Hours Access Fees: Prearranged after hours discharges are subject to a fee of $50.00 per truckload. Emergency after hours discharges are subject to a fee of $85.00 per truckload.

4) Administrative Notice of Violation Fees: Fees ranging from $50.00 to $600.00 are assessed to cover the cost of responding to permit violations. All requirements and policies described in the "Trucked Waste Requirements and Procedures" are incorporated in the permit by reference; failure to comply with any one of the requirements set forth herein constitutes a permit violation. When a pollutant limit is exceeded the resulting administrative fee is billed to the holder of the Trucked Industrial Waste Generator Permit. Administrative fees associated with other permit violations are billed to the Waste Hauler.

Section G: RETENTION OF RECORDS

1) The permittee shall retain records of all monitoring information, copies of all reports required by this permit, all manifests or vouchers, and records of all data used to complete the application for this permit, for a period of no less than three years after the permit is inactivated or, in the case of job-specific Industrial Permits, from the date the job is finished. This period may be extended by request of the IWCP at any time.

2) All records that pertain to matters that are the subject of special orders or any other enforcement or litigation activities brought by the IWCP shall be retained and preserved by the permittee until all enforcement activities have concluded and all periods of limitation with respect to any and all appeals have expired.

Section H: SIGNATORY REQUIREMENTS

Permit applications and self-monitoring forms must be signed and dated as required in Sections (1), (2), (3), or (4) below:

1) By a responsible corporate officer, if the Industrial User submitting the reports is a corporation. For the purpose of this paragraph, a responsible corporate officer means:

   a) a president, secretary, treasurer, or vice- president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or;
   b) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility, including having the explicit or implicit duty of making major capital investment recommendations, and initiate and direct other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; can ensure that the necessary systems are established or actions taken to gather complete and accurate information for control mechanism requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

2) By a general partner or proprietor if the Industrial User submitting the reports is a partnership or sole proprietorship, respectively.

3) By the principal executive officer or director having responsibility for the overall operation of the discharging facility if the Industrial User submitting the reports is a Federal, State, or local governmental entity, or their agents.

4) By a duly authorized representative of the individual designated in paragraph (1), (2), or (3) of this section if:
   a) the authorization is made in writing by the individual described in paragraph (1), (2), or (3);
   b) the authorization specifies either an individual or a position having responsibility for the overall operation of the facility from which the Industrial Discharge originates, such as the position of plant manager, operator of a well, or a well field superintendent, or a position of equivalent responsibility, or having overall responsibility for environmental matters for the company; and
   c) the written authorization is submitted to the City.

Section I: Penalties

As provided in Sections 64.0301 and 64.0518 of the San Diego Municipal Code, the violation of Truckers Discharge Permit regulations may result in Penalties and Civil Liabilities including the suspension or revocation of the Discharge Permit and the right to discharge wastes into the Public Sewer. Any person who violates any permit condition, or who discharges wastewater which causes interference with the treatment process or pass through of pollutants, or who violates any cease and desist order, prohibition, effluent limitation or national pretreatment standard shall be liable civilly for a penalty not to exceed $2,500 for each day in which such violation occurs. Additionally, any person intentionally causing such violations shall be liable, upon conviction,

for a sum not to exceed $25,000 for each day in which such violation occurs, or for imprisonment for not more than one year, or both.

Section J: Changes

The Trucked Industrial Waste Generator permittee shall give written notice to the Industrial Wastewater Control Program prior to any facility expansion, production increase, or process modification which results in new discharges or a change in the nature of the discharge or an increase in the daily maximum discharge volume by more than fifteen percent (15%). Prior to changing their designated waste hauler, a Trucked Industrial Waste Generator Permittee must obtain a permit amendment reflecting the change. Trucked Domestic and Industrial Waste Haulers must provide written notification of license plate and tank volume changes to permitted waste hauling vehicles prior to dumping from that vehicle.

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TRUCKED WASTE REQUIREMENTS CERTIFICATION

City of San Diego Public Utilities Dept
Industrial Wastewater Control Program
9192 Topaz Way, San Diego, CA 92123-1119
Tel (858) 654-4100 Fax (858) 654-4110

Applicability: Any industry seeking a Trucked Domestic Waste Hauler Permit, Trucked Industrial Waste Hauler Permit, or a Trucked Industrial Waste Generator Permit must certify in writing that they are familiar with the current Trucked Waste Requirements and Procedures and the Department of Toxic Substances Control Hazardous Waste Generator Requirements documents provided at the time of permit application. To report compliance with this requirement, the following statement must be submitted, signed as required in the **Trucked Waste Requirements and Procedures Section H: Signatory Requirements**.

KNOWLEDGE OF TRUCKED WASTE REQUIREMENTS CERTIFICATION STATEMENT

Based on my management of operations at the permitted facility, or my inquiry of the person or persons so managing, I certify we have received and are familiar with the requirements detailed in the following Trucked Waste Permit Documents:

- Trucked Waste Requirements and Procedures (Rev. 05/10)
- Hazardous Waste Generator Requirements California Environmental Protection Agency (CAL/EPA), Department of Toxic Substances Control (DTSC)

I am aware of the potential for significant penalties for submission of false information, including the possibility of fines and imprisonment for knowing violations.

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Facility Number

Facility Name

Print Name

Title

Signature

Date