Work Variance Request Form

Groundwater Remedy Phase 2B Construction, PG&E Topock Compressor Station, Needles, California

PG&E TOPOCK GROUNDWATER REMEDIATION PROJECT

Work Variance Request #15 – Proposed Modification of IRL-4 Access Road for Dual Rotary Rig Access and Incorporation of Pre-Cast Concrete Retaining Wall

Request Prepared By: PG&E	Request Approval From: DTSC and DOI
Date Submitted: 5/22/2025	Date Approval Required: To Be Determined
Variance Request No.: 15	Map Area: See attached drawings
Location: IRL-4 Access Road	

Land Manager/Parcel No.: BLM/APN 650-161-09

Current Vegetative Cover/Land Use: Sparse vegetation/Vacant Land

Existing Sensitive Resource? [X] No [ ] Yes

Variance From: [ ] Mitigation Measure [ ] Work Plan/Procedure [ ] Response to Comments Drawing

[X] Permit Condition [ ] Other – 2015 Basis of Design (BOD) Drawings C-05-01/C-05-02

Detailed Description of Variance and Justification (Attach additional information if necessary):

[X] Attachments: [ ] Photo [X] Construction Drawing [ ] Aerial Photo Mark-Up [ ] Correspondence [ ] Other

Potential Impacts of Variance:

[ ] Air Quality	[ ] Hazardous Materials	[X] Aesthetic
[ ] Biological Resources	[ ] Noise	[ ] Water Resources
[X] Soils	[ ] Paleo Resources	
[ ] Cultural Resources	[X] Hydrology and Water Quality (Mitigation Measure HYDRO-1)	

Work Variance Request Form (Continued)

Groundwater Remedy Phase 2B Construction, PG&E Topock Compressor Station, Needles, California

PG&E TOPOCK GROUNDWATER REMEDIATION PROJECT

Work Variance Request #15 – Proposed Modification of IRL-4 Access Road for Dual Rotary Rig Access and Incorporation of Pre-Cast Concrete Retaining Wall

Description and Justification:

This Work Variance Request (WVR) proposes to modify the design of the access road to remediation well Inner Recirculation Loop No. 4 (IRL-4). The rationale and specifics are described below and included in the attached drawings and visualization.

Justification for design modifications of access road to IRL-4

The approved 2015 Basis of Design (BOD) includes construction of an access road to remediation well IRL-4, shown in attached drawings C-05-01 (IRL-4 Access Road Site Plan), C-05-02 (IRL-4 Access Road-Sections), and C-00-05 (Civil Details). The BOD design drawings show a 14-foot wide, gravel access road, with v-ditch on both sides of the access road for stormwater erosion control. The access road is flanked on both sides by steep slopes. Two material modifications to this access road design are proposed and their justifications are below:

1) During a pre-work field review conducted in March 2025 in preparation for Phase 2b well drilling, Pacific Gas and Electric (PG&E) well drilling contractor, Cascade Environmental, indicated that their dual rotary drill rig will have difficulty in navigating the bend at the bottom of the access road as designed. Therefore, the road design was modified by removing the bend at the bottom for drill rig access.
2) In more recent years, erosion caused by storm events at the site has required more frequent maintenance of access roads used for groundwater remedy operation. Earthen steep slopes are especially susceptible to substantial erosion. Therefore, PG&E proposes to incorporate a pre-cast concrete retaining wall system by GRAVIX, into the access road to provide better protection against stormwater erosion and therefore, reduce maintenance over the anticipated decades-long duration of the Topock remediation project. This proposed modification complies with the 2018 Subsequent Environmental Impact Report (SEIR) Mitigation Measure HYDRO-1 for the groundwater remedy.

In total, it is estimated that this proposed design modification would result in a net reduction of 780 to 1,770 cubic yards in the volume of soil/materials disturbed.

Variance from 2018 SEIR Mitigation Measures AES-1d and AES-2e

The SEIR mitigation measures AES-1d and AES-2e for the groundwater remedy states that:

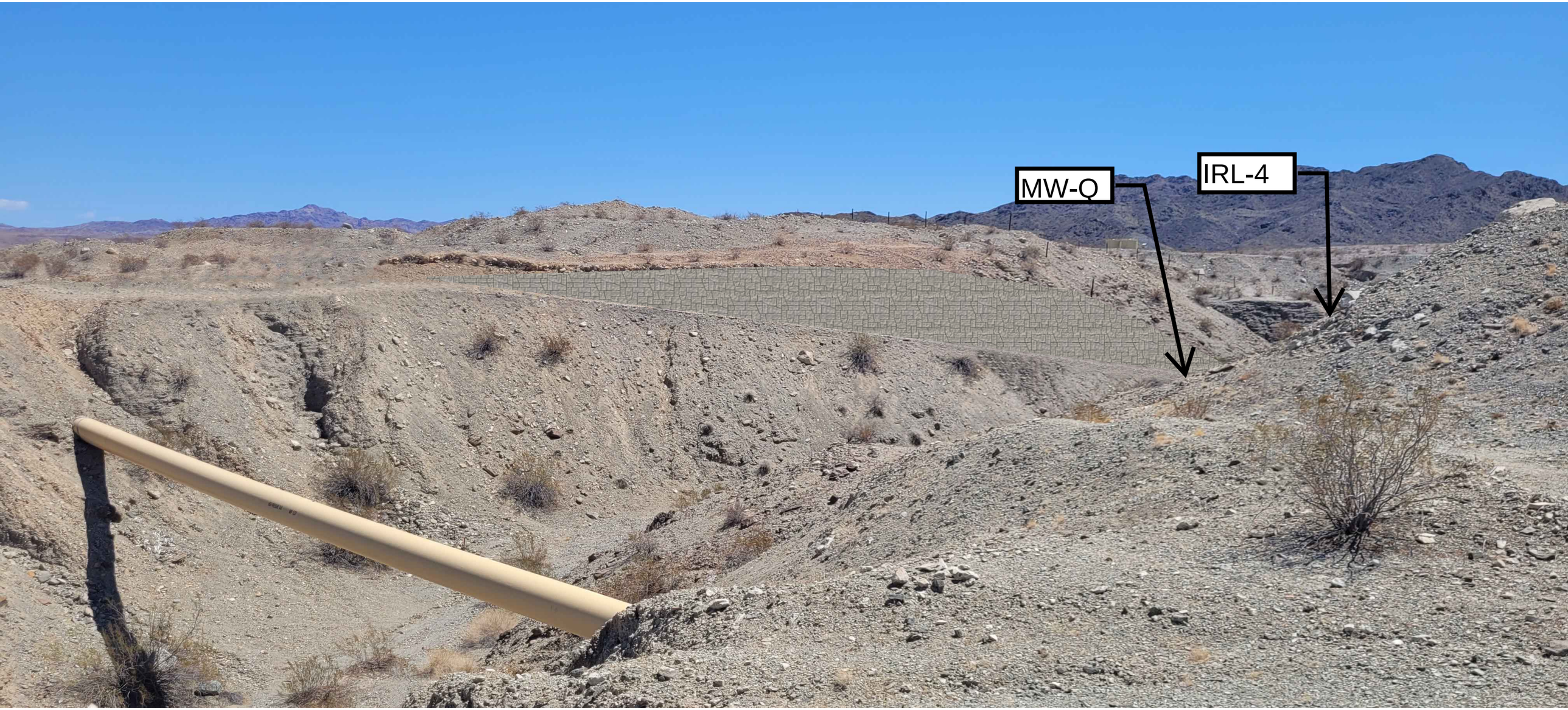
> "*The color of the wells, pipelines, reagent storage tanks, control structures, and utilities shall consist of muted, earth-tone colors that are consistent with the surrounding natural color palette. Matte finishes shall be used to prevent reflectivity. Integral color concrete should be used in place of standard gray concrete*."

The retaining wall vendor, GRAVIX, recently confirmed that their wall system cannot be cast with an integrated color. When a color is desired, concrete stains are used. If used, color stain re-application may be necessary over time. Attached is a concrete stain system and Safety Data Sheet from Sika that has earth-tone color options, Taupe or Weathered Bronze.

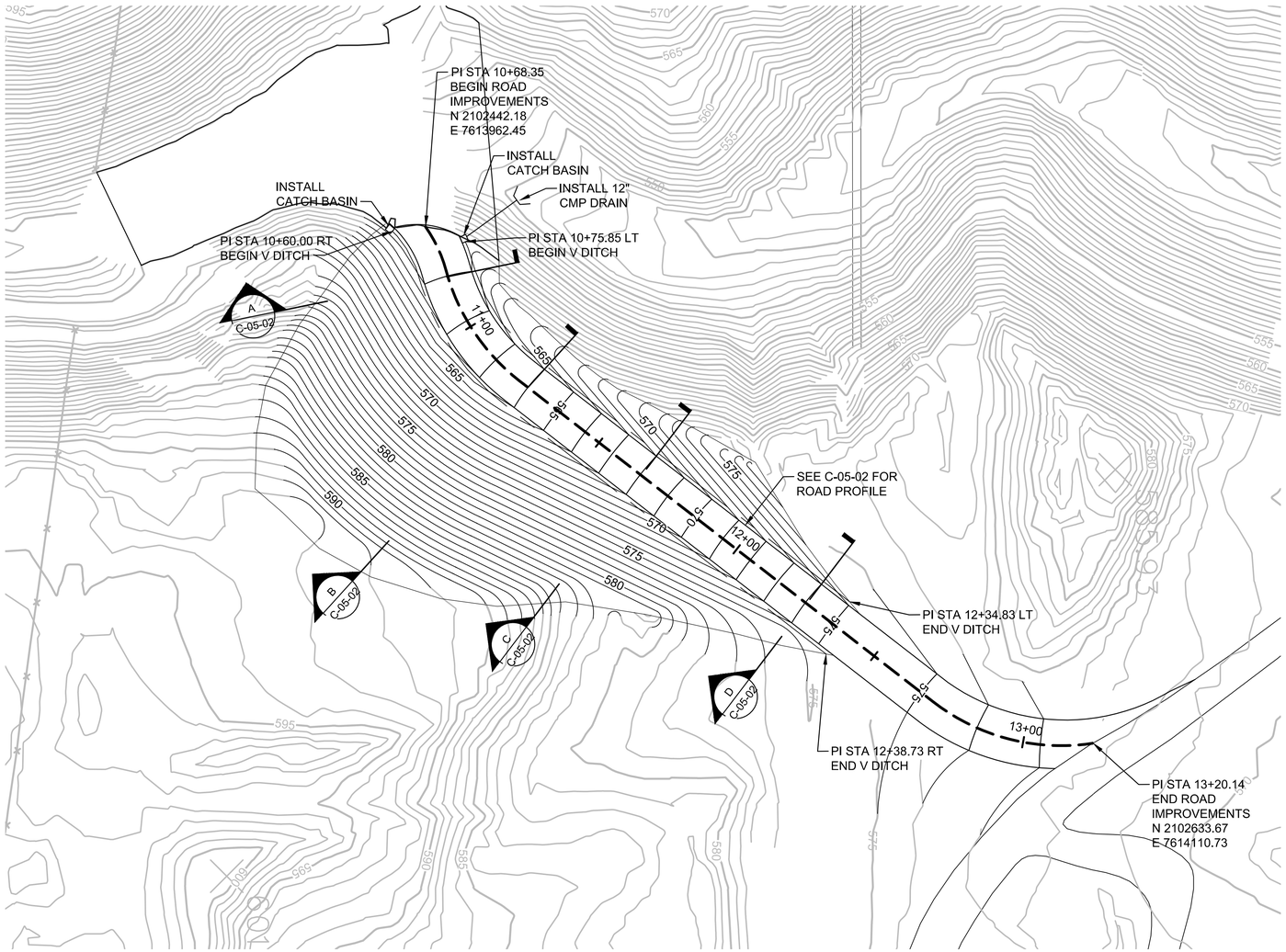
There are no additional impacts to biological, historical, and cultural resources associated with this WVR not already evaluated in the 2018 SEIR.

Approval Signatures:			
5/22/25			
PG&E Project Manager	Date	Approving Agency	Date
		Approving Agency	Date

PHOTO SIMULATION OF PROPOSED PRE-CAST CONCRETE RETAINING WALL AS PART OF THE IRL-4 ACCESS ROAD



Conceptual Visualization



2015 FINAL DESIGN

NOTE:
1. REFER TO STATIONING ON C-07-25 WHICH IS IDENTICAL TO PIPELINE H STATIONING.

LEGEND

———— = EDGE OF ROAD
—— – —— = FLOW LINE

0 20 40 60
HORZ: SCALE: 1"=20'

- FINAL DESIGN - FOR AGENCY APPROVAL ONLY

REGISTERED PROFESSIONAL ENGINEER
BENJAMIN J. WUERL
C 67811
EXP 6/30/17
STATE OF CALIFORNIA

ETIC ENGINEERING

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
2	11/18/15	FINAL DESIGN	AJW	WLM	BW	RAO	
1	9/8/14	PRE-FINAL (90%) DESIGN	WTH	PT	VMB	VMB	
0	4/5/13	INTERMEDIATE (60%) DESIGN	PC	PT	VMB	VMB	

REVISIONS

APPROVED BY	RAO
SO	
SUPV	
DSGN	
DWN	
CHKD	
OK	
DATE	
SCALES	

TOPOCK GROUNDWATER REMEDIATION PROJECT

IRL-4 ACCESS ROAD SITE PLAN

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
C-05-01	REV 2

N1808

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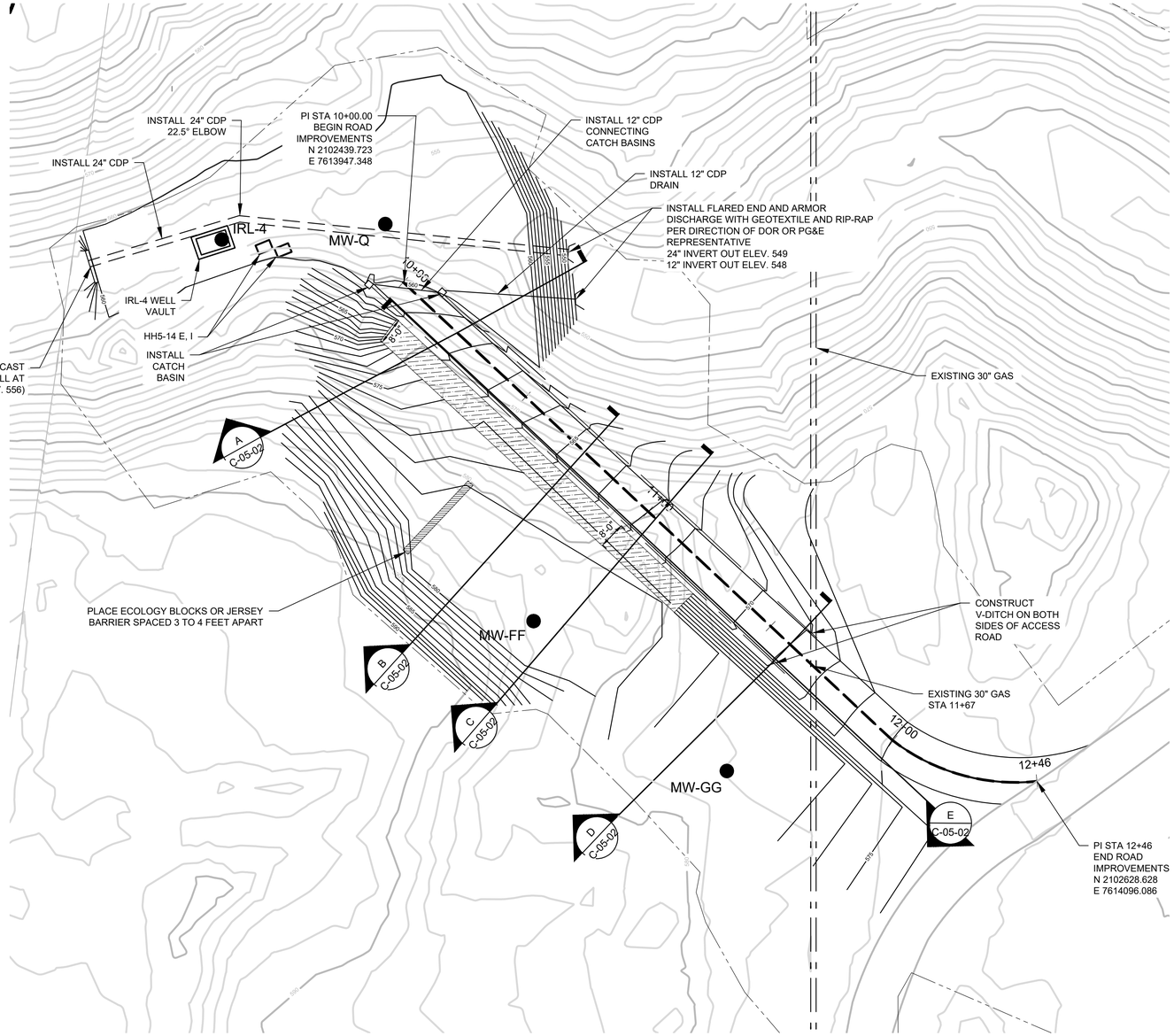
PROPOSED WORK VARIANCE REQUEST #15



IRL-4, MW-FF, MW-GG, AND MW-Q WELL PAD - PLAN

(SCALE: 1" = 20' H)

0 20 40 60

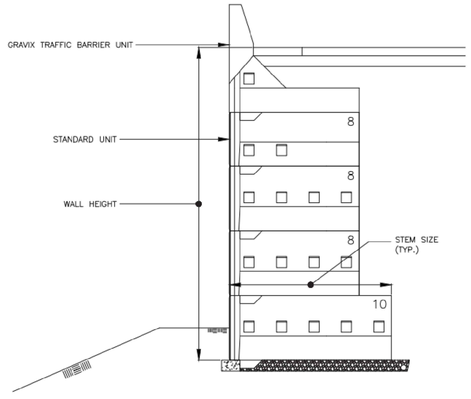
HORZ: SCALE: 1"=20'

NOTES:

1. REFER TO STATIONING ON C-07-25 WHICH IS IDENTICAL TO PIPELINE H STATIONING
2. CDP = CORRUGATED DRAIN PIPE

LEGEND

- EDGE OF ROAD
- CONSTRUCTION BOUNDARY
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED CONTOURS
- EXISTING DIRT ROAD
- EXISTING FENCE
- IRL-4 ACCESS ROAD PROFILE ALIGNMENT
- GRAVIX COMMERCIAL RETAINING WALL



Roadway Surcharge, 250 PSF Backfill Unit Weight γ = 120 PCF

Wall Height	Φ = 30° Soil Backfill: Unit Stem Size Needed								Wall Height	Φ = 36° Gravel Backfill: Unit Stem Size Needed							
	TB	8'	10'	12'	14'	16'	18'	20'		TB	8'	10'	12'	14'	16'	18'	20'
4.0'	1								4.0'	1							
8.0'	1	1							8.0'	1	1						
12.0'	1	2							12.0'	1	2						
16.0'	1	3							16.0'	1	3						
20.0'	1	3	2						20.0'	1	4						
24.0'	1	2	1	2					24.0'	1	4	1					
28.0'	1	1	2	1	2				28.0'	1	3	2	1				
32.0'	1	1	1	2	1	2			32.0'	1	3	2	1	1			
36.0'	1	1	1	2	1	1	2		36.0'	1	3	2	1	1	1		
40.0'	1	1	1	1	2	1	1	2	40.0'	1	3	2	1	1	1	1	

The soils effective friction angle and unit weight as outlined above is assumed to be used within, behind and beneath the retaining wall.

GRAVIX COMMERCIAL RETAINING WALL SYSTEM

(SCALE: NTS)

ESTIMATED EARTHWORK VOLUMES
IRL-4, MW-FF, AND MW-Q DRILLING PAD

	2D AREA (SQ. FT.)	CUT (CU. YD.)	FILL (CU. YD.)	NET (CU. YD.)
TOTAL EXCAVATION	30,680	1,840	1,260	580 <CUT>

REGISTERED PROFESSIONAL ENGINEER BRIAN L PROVID C 76874 EXP 12/26 CIVIL STATE OF CALIFORNIA

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
5	5/21/25	PHASE 2B DRILLING PAD GRADING IFC		MJS	VJM	JP	JPB
4	02/28/25	PHASE 2B DRILLING PAD GRADING IFB		MJS	VJM	BLP	JPB
3	1/17/25	PHASE 2B ISSUED FOR BID		SAW	VJM	BLP	JPB
2	11/18/15	FINAL DESIGN		AJW	WLM	BW	RAO
1	9/8/14	PRE-FINAL (90%) DESIGN		WTH	PT	VMB	VMB
0	4/5/13	INTERMEDIATE (60%) DESIGN		PC	PT	VMB	VMB

REVISIONS

APPROVED BY: JPB

SO | SUPV | DSGN | DWN | CHKD | OK | DATE | SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT

IRL-4 ACCESS ROAD SITE PLAN

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM | BILL OF MATL | DWG LIST | SUPSDS | SUPSD BY

SHEET NO. C-05-01 of SHEETS | REV 5

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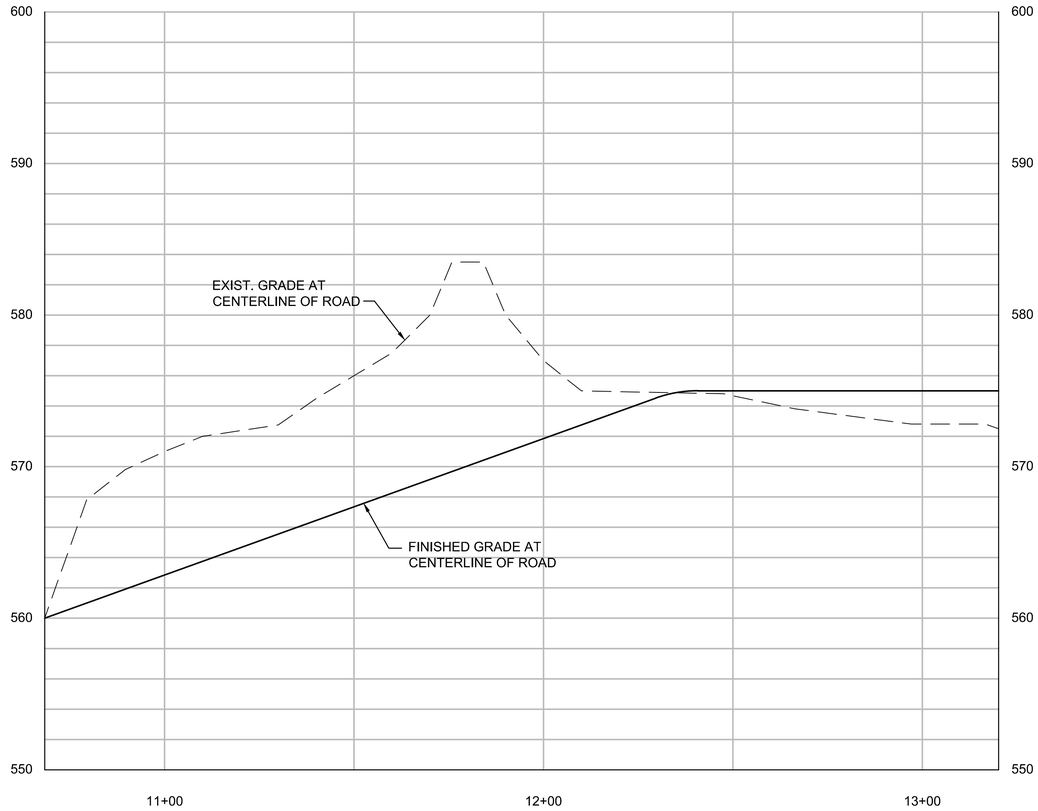
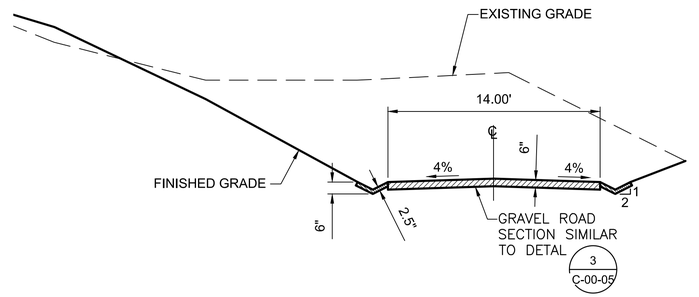
2015 FINAL DESIGN





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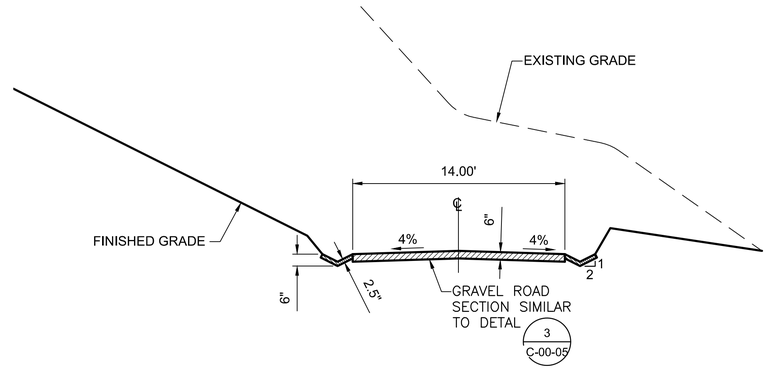

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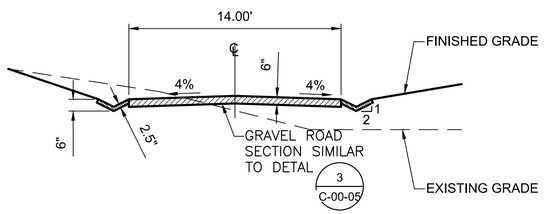
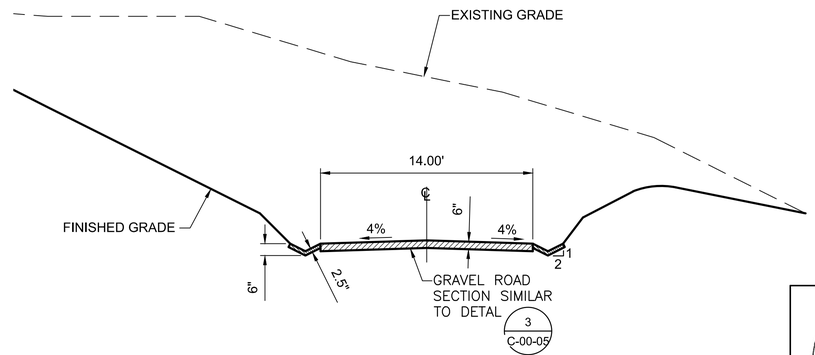
IRL-4 ACCESS ROAD





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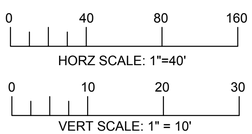
1" = 5'-0"

A C-05-01 — SECTION @ STA 11+65.00
1" = 5'-0"



- FINAL DESIGN -
FOR AGENCY APPROVAL ONLY

REGISTERED PROFESSIONAL ENGINEER
BENJAMIN J. WUERL
C 67811
EXP 6/30/17
STATE OF CALIFORNIA

ETIC ENGINEERING

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
2	11/18/15	FINAL DESIGN		AJW	WLM	BW	RAO
1	9/8/14	PRE-FINAL (90%) DESIGN		PH	PT	VMB	VMB
0	4/5/13	INTERMEDIATE (60%) DESIGN		PC	PT	VMB	VMB

REVISIONS

APPROVED BY	
RAO	SO
	SUPV
	DSGN
	DWN
	CHKD
	OK
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT

IRL-4 ACCESS ROAD - SECTIONS

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
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SHEET NO.	of SHEETS
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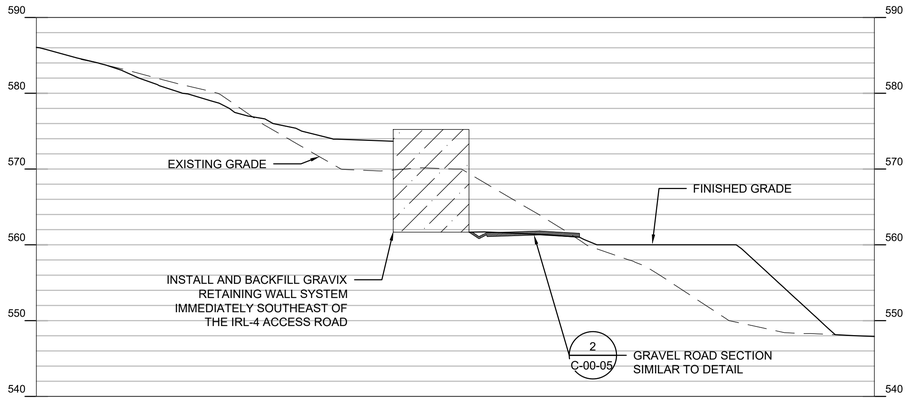
PROPOSED WORK VARIANCE REQUEST #15



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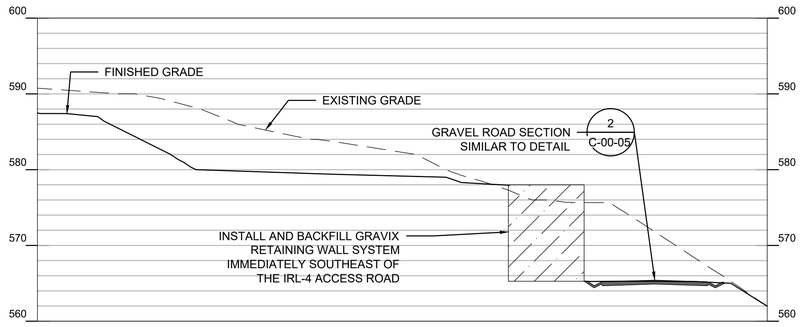

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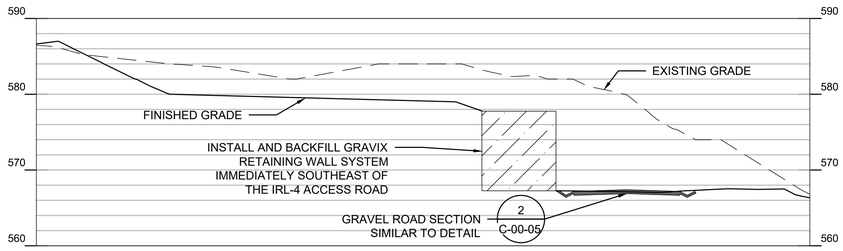

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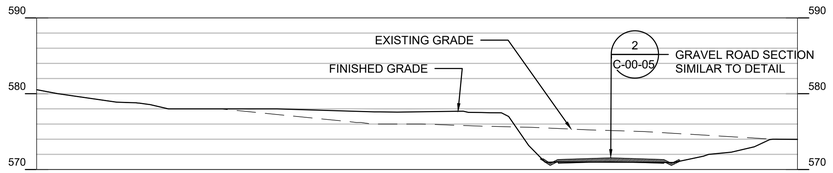

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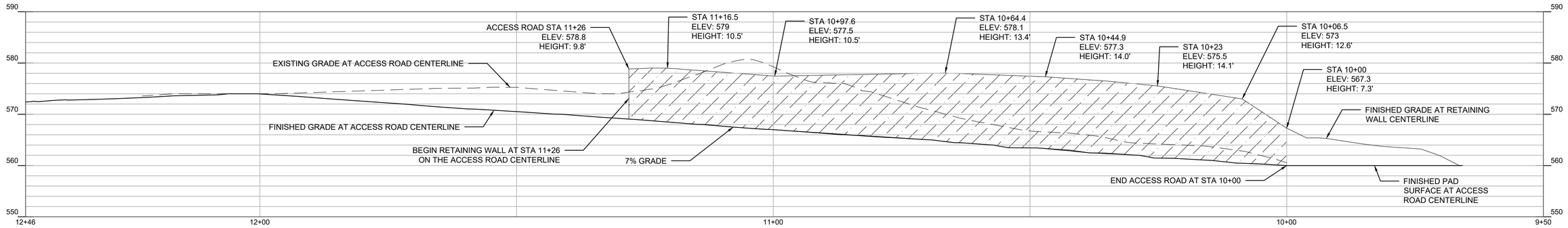

E C-05-01 — ACCESS ROAD AND RETAINING WALL PROFILE
1" = 10'-0" (HORIZONTAL AND VERTICAL)

0 10 20 30
HORIZONTAL/ VERTICAL SCALE: 1" = 10'

LEGEND
- EXISTING GRADE
- FINISHED GRADE
- GRAVEL ROAD
- RETAINING WALL

REGISTERED PROFESSIONAL ENGINEER
BRIAN L PROWD
C 76874
EXP 12/26
CIVIL
STATE OF CALIFORNIA

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
5	5/21/25	PHASE 2B DRILLING PAD GRADING IFC		MJS	VJM	JP	JPB
4	2/28/25	PHASE 2B DRILLING PAD GRADING IFB		MJS	VJM	BLP	JPB
3	1/17/25	PHASE 2B ISSUED FOR BID		SAW	VJM	BLP	JPB
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1	9/8/14	PRE-FINAL (90%) DESIGN		PH	PT	VMB	VMB
0	4/5/13	INTERMEDIATE (60%) DESIGN		PC	PT	VMB	VMB

REVISIONS

APPROVED BY	
JPB	SO
	SUPV
	DSGN
	DWN
	CHKD
	OK
	DATE
	SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT

IRL-4 ACCESS ROAD - SECTIONS

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO.	of SHEETS
C-05-02	REV 5

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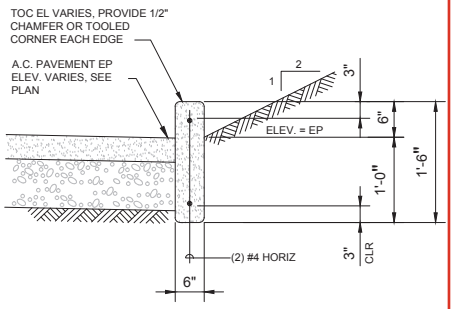
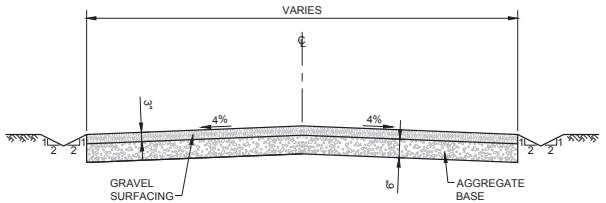
Project Files\Phase 2B Design\Drill Pads\C-45-02.dwg, Tab: Layout1

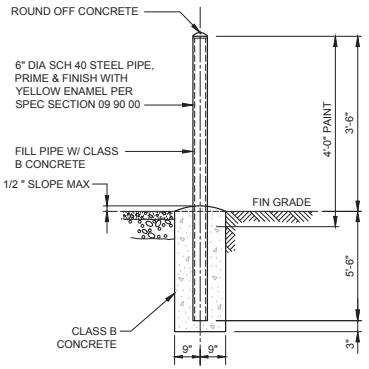
2015 Basis of Design



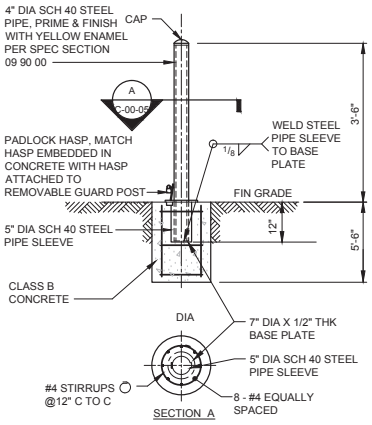
1 CONCRETE CURB
NTS
S-12-03



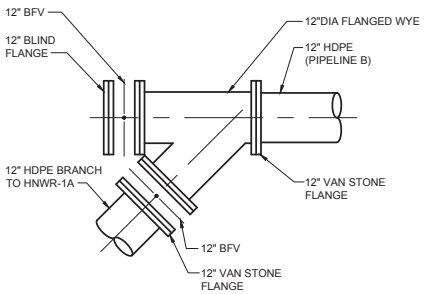
2 GRAVEL ENTRANCE ROAD SECTION
NTS
C-01-01



3 FIXED GUARD POST DETAIL
NTS
S-12-03

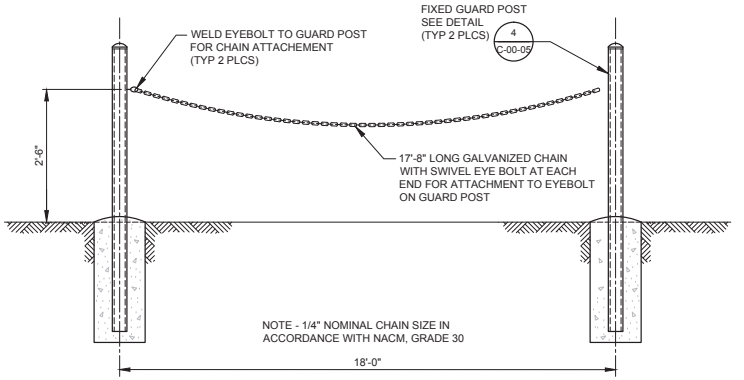


4 REMOVABLE GUARD POST DETAIL
NTS
S-12-03



NOTE:
THIS DETAIL APPLIES IF PIPELINE B IS NOT EXTENDED TO SITE B.

5 TERMINATION DETAIL FOR PIPELINE B
NTS
C-01-01



6 CABLE AND POST ACCESS GATE
NTS
S-12-03

- FINAL DESIGN - FOR AGENCY APPROVAL ONLY

REGISTERED PROFESSIONAL ENGINEER BENJAMIN J. WURL C 67811 CIVIL STATE OF CALIFORNIA

ETIC ENGINEERING

ARCADIS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
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0	9/8/14	PRE-FINAL (90%) DESIGN		PH	PT	PT	VMB

REVISIONS

APPROVED BY: RAO

SO
SUPV
DSGN
DWN
CHKD
OK
DATE
SCALES

TOPOCK GROUNDWATER REMEDIATION PROJECT

CIVIL DETAILS

GAS TRANSMISSION & DISTRIBUTION
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

MICROFILM
BILL OF MATL
DWG LIST
SUPSDS
SUPSD BY
SHEET NO. C-00-05 of SHEETS
REV 2

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N1808

SikaColor®-430 Elements®
WATER-BASED STAIN

BUILDING TRUST

SikaColor®-430 Elements® must be applied with an HVLP or pneumatic airless sprayer.

***INDICATES FOR INTERIOR USE ONLY**

COLOR CHART BEST VIEWED IN SUNLIGHT

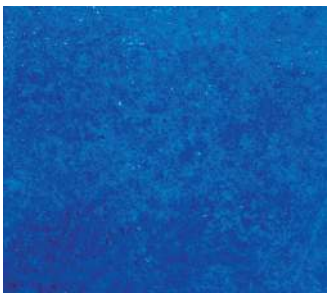
NOT FOR COLOR MATCHING

ELE110 White

ELE129 Brown

ELE123 Yellow

ELE124 Red*



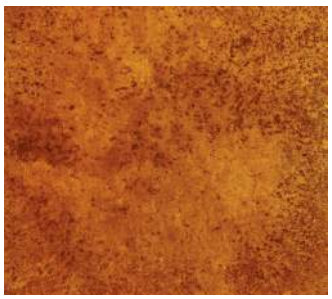
ELE125 Blue

ELE126 Black

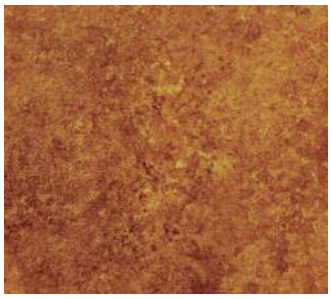
ELE127 Purple*

ELE128 Gray

ELE113 Verdigris



ELE111 Tannin



ELE112 Balkan Amber

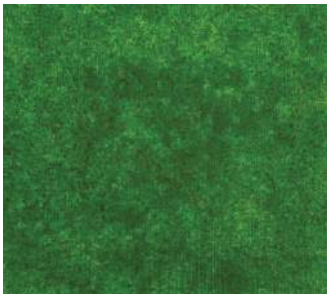
ELE116 Caribbean

ELE115 Stygian

ELE118 Weathered Bronze

ELE114 Cordovan Leather

ELE122 Taupe



ELE117 Lichen

ELE119 Kona Brown

Colors shown on this chart approximate the color of the stain when applied to medium gray cement. Concrete color is altered by many factors, including cement and aggregate color, slump, finishing practices, and curing method. Using the contemplated materials and construction techniques, representative samples should be cast for approval, especially when exact color matching is important.

SikaColor®-430 Elements®
WATER-BASED STAIN

SikaColor®-430 Elements® is a low odor, water-based, environmentally and user-friendly concrete stain with low VOC. SikaColor®-430 Elements® represents the latest in nanopigment technology. It is formulated to readily permeate a properly prepared concrete surface and create translucent color variations similar to reactive acid stain. It is an excellent substitute for reactive chemical stains on substrates that are minimally reactive with acid stains or when a color is desired that cannot be produced by an acid stain.

- **18 standard colors**
- **Must be applied with HVLP or pneumatic airless sprayer**
- **Low VOC, low odor**
- **Creates translucent mottled color**
- **Expanded color range compared to chemical stain**
- **Soap and water clean-up**
- **Does not contain acid**
- **Multiple colors may be used for a more creative effect**
- **Can be blended with other colors to create a unique color palette**

SIKA CORPORATION
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Our most current General Sales Conditions shall apply.

Please consult the Product Data Sheets prior to any use and processing.

BUILDING TRUST

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SECTION 1. IDENTIFICATION

Product name	:	SikaColor®-430 Elements®
Company name	:	Sika Corporation 201 Polito Avenue Lyndhurst, NJ 07071 USA www.sikausa.com
Telephone	:	(201) 933-8800
Telefax	:	(201) 804-1076
E-mail address	:	ehs@sika-corp.com
Emergency telephone	:	CHEMTREC: 800-424-9300 INTERNATIONAL: +1-703-527-3887
Recommended use of the chemical and restrictions on use	:	For further information, refer to product data sheet.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Eye irritation	:	Category 2A
Skin sensitization	:	Category 1
Reproductive toxicity	:	Category 2

GHS label elements

Hazard pictograms :

Signal Word	:	Warning
Hazard Statements	:	H317 May cause an allergic skin reaction. H319 Causes serious eye irritation. H361 Suspected of damaging fertility or the unborn child.
Precautionary Statements	:	**Prevention:** P201 Obtain special instructions before use. P202 Do not handle until all safety precautions have been read and understood.

P261 Avoid breathing mist or vapors.
P264 Wash skin thoroughly after handling.
P272 Contaminated work clothing must not be allowed out of the workplace.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P362 + P364 Take off contaminated clothing and wash it before reuse.

Storage:

P405 Store locked up.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Additional Labeling

There are no ingredients with unknown acute toxicity used in a mixture at a concentration >= 1%.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Mixtures

Components

Chemical name	CAS-No.	Classification	Concentration (% w/w)
2-methylpropan-1-ol	78-83-1	Flam. Liq. 3; H226 Skin Irrit. 2; H315 Eye Dam. 1; H318 STOT SE 3; H335, H336	>= 1 - < 5
2-dimethylaminoethanol	108-01-0	Acute Tox. 4; H302 Acute Tox. 3; H331 Acute Tox. 4; H312 Skin Corr. 1B; H314 STOT SE 3; H335	>= 0.1 - < 1
4,4-dimethyloxazolidine	51200-87-4	Flam. Liq. 3; H226 Acute Tox. 4; H302 Acute Tox. 3; H331	>= 0.1 - < 1

		Acute Tox. 3; H311 Skin Irrit. 2; H315 Eye Dam. 1; H318	
Hydroxyphenyl-benzotriazol derivates	104810-47-1	Skin Sens. 1A; H317	>= 0.1 - < 1
Pentamethyl piperidylsebacate	41556-26-7	Skin Sens. 1A; H317 Repr. 2; H361	>= 0.1 - < 1
Poly(oxy-1,2-ethanediyl), .alpha.-[3-[3-(2H-benzotriazol-2-yl)-5-(1,1-dimethylethyl)-4-hydroxyphenyl]-1-oxopropyl]-.omega.-hydroxy-	104810-48-2	Skin Sens. 1A; H317	>= 0.1 - < 1

Actual concentration is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

General advice : Move out of dangerous area.
Consult a physician.
Show this material safety data sheet to the doctor in attendance.

If inhaled : Move to fresh air.
Consult a physician after significant exposure.

In case of skin contact : Take off contaminated clothing and shoes immediately.
Wash off with soap and plenty of water.
If symptoms persist, call a physician.

In case of eye contact : Immediately flush eye(s) with plenty of water.
Remove contact lenses.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.

If swallowed : Clean mouth with water and drink afterwards plenty of water.
Do not induce vomiting without medical advice.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
Obtain medical attention.

Most important symptoms and effects, both acute and delayed : Allergic reactions
Excessive lachrymation
irritant effects
sensitizing effects
May cause an allergic skin reaction.
Causes serious eye irritation.
Suspected of damaging fertility or the unborn child.

Notes to physician : Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Special protective equipment for fire-fighters	:	In the event of fire, wear self-contained breathing apparatus.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Use personal protective equipment. Deny access to unprotected persons.
Environmental precautions	:	Do not flush into surface water or sanitary sewer system. If the product contaminates rivers and lakes or drains inform respective authorities. Local authorities should be advised if significant spillages cannot be contained.
Methods and materials for containment and cleaning up	:	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion	:	Normal measures for preventive fire protection.
Advice on safe handling	:	Avoid exceeding the given occupational exposure limits (see section 8). Do not get in eyes, on skin, or on clothing. For personal protection see section 8. Persons with a history of skin sensitization problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used. Smoking, eating and drinking should be prohibited in the application area. Follow standard hygiene measures when handling chemical products.
Conditions for safe storage	:	Store in original container. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Store in accordance with local regulations.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
2-methylpropan-1-ol	78-83-1	TWA	50 ppm	ACGIH
		TWA	100 ppm 300 mg/m3	OSHA Z-1
		TWA	50 ppm 150 mg/m3	OSHA P0

The above constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit. At this time, the other constituents have no known exposure limits.

Engineering measures : Use of adequate ventilation should be sufficient to control worker exposure to airborne contaminants. If the use of this product generates dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.

Personal protective equipment

Respiratory protection : Use a properly fitted NIOSH approved air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary.

The filter class for the respirator must be suitable for the maximum expected contaminant concentration (gas/vapor/aerosol/particulates) that may arise when handling the product. If this concentration is exceeded, self-contained breathing apparatus must be used.

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Eye protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary.

Skin and body protection : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.

Hygiene measures : Avoid contact with skin, eyes and clothing.
Wash hands before breaks and immediately after handling the product.
Remove contaminated clothing and protective equipment before entering eating areas.
Wash thoroughly after handling.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Color	:	various
Odor	:	slight
Odor Threshold	:	No data available
pH	:	No data available
Melting point/range	:	32 °F / 0 °C
Boiling point/boiling range	:	212 °F / 100 °C
Flash point	:	> 199.99 °F / > 93.33 °C (Method: closed cup)
Evaporation rate	:	No data available
Flammability (solid, gas)	:	No data available
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapor pressure	:	23 hpa
Relative vapor density	:	No data available
Density	:	ca. 1 g/cm3 (73 °F / 23 °C)
Solubility(ies)		
Water solubility	:	soluble
Solubility in other solvents	:	No data available
Partition coefficient: n-octanol/water	:	No data available
Autoignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity		
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	> 20.5 mm2/s (104 °F / 40 °C)
Explosive properties	:	No data available
Oxidizing properties	:	No data available

Volatile organic compounds (VOC) content	:	98 g/l

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No dangerous reaction known under conditions of normal use.
Chemical stability	:	The product is chemically stable.
Possibility of hazardous reactions	:	Stable under recommended storage conditions.
Conditions to avoid	:	No data available
Incompatible materials	:	No data available
Hazardous decomposition products	:	No decomposition if stored and applied as directed.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Not classified based on available information.

Components:

2-dimethylaminoethanol:

Acute inhalation toxicity	:	LC50 (Rat): 6.1 mg/l Exposure time: 4 h Test atmosphere: vapor

4,4-dimethyloxazolidine:

Acute oral toxicity	:	LD50 Oral (Rat): 956 mg/kg
Acute inhalation toxicity	:	LC50 (Rat): 2.91 mg/l Exposure time: 4 h Test atmosphere: vapor
Acute dermal toxicity	:	LD50 Dermal (Rabbit): 970 mg/kg

Skin corrosion/irritation

Not classified based on available information.

Serious eye damage/eye irritation

Causes serious eye irritation.

Respiratory or skin sensitization

Skin sensitization

May cause an allergic skin reaction.

Respiratory sensitization

Not classified based on available information.

Germ cell mutagenicity

Not classified based on available information.

Carcinogenicity

Not classified based on available information.

IARC	Group 2B: Possibly carcinogenic to humans	
	Titanium dioxide (> 10 µm)	13463-67-7
	Group 2B: Possibly carcinogenic to humans	
	Carbon black	1333-86-4
OSHA	Not applicable	
NTP	Not applicable	

Reproductive toxicity

Suspected of damaging fertility or the unborn child.

STOT-single exposure

Not classified based on available information.

STOT-repeated exposure

Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Aspiration toxicity

Not classified based on available information.

Further information

Product:

Remarks : Carbon black (1333-86-4)
Animal Toxicity:
Rat, oral, duration 2 year
Effect: no tumors

Mouse, oral, duration 2 years
Effect: no tumors
Mouse, dermal, duration 18 months
Effect: no skin tumors
Rat, inhalation, duration 2 years
Target organ: lungs
Effect: inflammation, fibrosis, tumors
Note: Tumors in the rat lung are considered to be related to the "particle overload phenomenon" rather than to a specific chemical effect of carbon black itself in the lung. These effects in rats have been reported in many studies on other poorly soluble inorganic particles and appear to be rat specific. Tumors have not been observed in other species (i.e., mouse and hamster) for carbon black or other poorly soluble particles under similar circumstances and study conditions.
Mortality studies (human data): A study on carbon black production workers in the UK (Sorahan, 2001) found an increased risk of lung cancer in two of the five plant studied;

however, the increase was not related to the dose of carbon black. Thus, the authors did not consider the increased risk in lung cancer to be due to carbon black exposure. A German study of carbon black workers at one plant (Morfeld, 2006; Buechte, 2006) found a similar increase in lung cancer risk but, like the Sorohan, 2001 (UK study) found no association with carbon black exposure. A large US study of 18 plants showed a reduction in lung cancer risk in carbon black production workers (DEII, 2006). Based upon these studies, the February 2006 Working Group at the International Agency for Research on Cancer (IARC) concluded that the human evidence for carcinogenicity was inadequate (IARC, 2010).
Since the IARC evaluation of carbon black, Sorahan and Harrington (2007) have re-analyzed the UK study data using an alternative exposure hypothesis and found a positive association with carbon black exposure in two of the five plants. The same exposure hypothesis was applied by Morfeld and McCunney (2009) to the German cohort; in contrast, they found no association between carbon black exposure and lung cancer risk and, thus, no support for the alternative exposure hypothesis used by Sorahan and Harrington.
Overall, as a result of these detailed investigations, no causative link between carbon black exposure and cancer risk in humans has been demonstrated.
IARC CANCER CLASSIFICATION: In 2006 IARC re-affirmed its 1995 finding that there is "inadequate evidence" from human health studies to assess whether carbon black causes cancer in humans. IARC concluded that there is "sufficient evidence" in experimental animal studies for the carcinogenicity of carbon black. IARC's overall evaluation is that carbon black is "possibly carcinogenic to humans" (Group 2B)". This conclusion was based on IARC's guidelines, which generally require such a classification if one species exhibits carcinogenicity in two or more animal studies (IARC, 2010).

Solvent extracts of carbon black were used in one study of rats in which skin tumors were found after dermal application and several studies of mice in which sarcomas were found following subcutaneous injection. IARC concluded that there was "sufficient evidence" that carbon black extracts can cause cancer in animals (Group 2B).
ICGIH CANCER CLASSIFICATION: Confirmed Animal Carcinogen with Unknown Relevance to Humans (Category A3 Carcinogen).

ASSESSMENT: Applying the guidelines of self-classification under the Globally Harmonized System of Classification and Labeling of Chemicals, carbon black is not classified as a carcinogen. Lung tumors are induced in rats as a result of repeated exposure to inert, poorly soluble particles like carbon black and other poorly soluble particles. Rats tumors are a result of a secondary non-genotoxic mechanism that has questionable relevance for classification in humans. In support of this opinion, the CLP Guidance for Specific Target Organ

Toxicity - Repeated Exposure (STOT-RE), cites lung overload under mechanisms not relevant to humans. Human health studies show that exposure to carbon black does not increase the risk to carcinogenicity.

Titanium dioxide (13463-67-7)
In lifetime inhalation studies of rats, airborne respirable-size titanium dioxide particles have shown to cause an increase in lung tumors at concentrations associated with substantial particle lung burdens and consequential pulmonary overload and inflammation. The potential for these adverse health effects appears to be closely related to the particle size and the amount of the exposed surface area that comes into contact with the lung. However, tests with other laboratory animals such as mice and hamsters, indicate that rats are significantly more susceptible to the pulmonary overload and inflammation that causes lung cancer. Epidemiological studies do not suggest an increased risk of cancer in humans from occupational exposure to titanium dioxide. Titanium dioxide has been characterized by IARC as possibly carcinogenic to humans (Group 2B) through inhalation (not ingestion). It has not been characterized as a potential carcinogen by either NTP or OSHA.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity
No data available

Persistence and degradability
No data available

Bioaccumulative potential
No data available

Mobility in soil
No data available

Other adverse effects

Product:

Additional ecological information	:	Do not empty into drains; dispose of this material and its container in a safe way. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR
Not regulated as a dangerous good

IMDG-Code
Not regulated as a dangerous good

Domestic regulation

49 CFR
Not regulated as a dangerous good

SECTION 15. REGULATORY INFORMATION

TSCA list : All chemical substances in this product are either listed on the TSCA Inventory or are in compliance with a TSCA Inventory exemption.

CERCLA Reportable Quantity
This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity
This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity
This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Respiratory or skin sensitization
Reproductive toxicity
Serious eye damage or eye irritation

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act
This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

California Prop. 65
⚠ **WARNING:** This product can expose you to chemicals including Titanium dioxide, which is known to the State of California to cause cancer, and ethylene oxide, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

SECTION 16. OTHER INFORMATION

Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
OSHA P0	:	USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA	:	8-hour, time-weighted average
OSHA P0 / TWA	:	8-hour time weighted average
OSHA Z-1 / TWA	:	8-hour time weighted average

Notes to Reader

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