



BEFORE THE DIRECTOR OF THE ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

In the Matter of:
Phelps Dodge Sierrita Mine located at 6200 West Duval Mine Road, Green Valley, Arizona
ADEQ Identification Number: 101679

MITIGATION ORDER ON CONSENT

Docket No. P-50-06

To: Phelps Dodge Sierrita, Inc. (PDSI) in its capacity as owner and/or operator of Phelps Dodge Sierrita Mine (PDSM) located at 6200 West Duval Mine Road, Green Valley, Pima County, Arizona.

RECITALS

PDSI acknowledges that no promise of any kind or nature whatsoever was made to induce it to enter into this Consent Order, and PDSI has done so voluntarily.

PDSI acknowledges that by entering into this Consent Order, it does not resolve any liability it may have for civil penalties for violations of any State or Federal environmental law.

By entering into this Consent Order, PDSI does not admit to any civil or criminal liability, or waive any right including but not limited to the assertion of any defense available to PDSI under applicable law. Further, PDSI does not admit, and both the Arizona Department of Environmental Quality ("ADEQ") and PDSI retain the right to controvert in any subsequent proceeding except a proceeding to implement or enforce this Consent Order, the validity of any Findings of Fact or Conclusions of Law contained in this Consent Order.

The undersigned representative of PDSI certifies that he is fully authorized to execute this Consent Order on behalf of PDSI and to legally bind PDSI to this Consent Order.

PDSI admits to the jurisdiction of the Director of ADEQ.

Except as to the right to controvert the validity of any Findings of Fact or Conclusion of Law contained in this Consent Order in a proceeding other than to enforce this Consent Order, PDSI consents to the terms and entry of this Consent Order and agrees not to contest the validity or terms of this Consent Order in any subsequent proceeding.

THEREFORE, IT IS HEREBY ORDERED as follows:

I. JURISDICTION

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The Director of ADEQ has jurisdiction over the subject matter of this action and is authorized to issue this Consent Order pursuant to the Arizona Revised Statutes ("A.R.S.") § 49-261, and A.R.S. § 49-286.

II. FINDINGS

THE DIRECTOR HEREBY MAKES THE FOLLOWING FINDINGS OF FACT AND CONCLUSIONS OF LAW:

A. Findings of Fact

1. PDSI owns and operates the Phelps Dodge Sierrita Mine (PDSM), an open pit mine and mineral concentration facility, located six (6) miles northwest of Green Valley at 6200 West Duval Mine Road, Green Valley, Arizona.

2. Available data indicate that at the time of entry of this Consent Order, depths to groundwater in the vicinity of Green Valley, particularly in the area of Township 18 South, Range 13 East (G.&S.R.B.&M), the south ½ of section 9, section 16, section 21, and the west ½ of section 28, range from 250 to 400 feet below ground surface. Overall groundwater flow in the vicinity of PDSM is from west to east with flow direction changing to northeast on the lower basin near the Santa Cruz River.

3. PDSM has a tailings impoundment that is underlain with a thick sequence of poorly to moderately consolidated Quaternary sediments. A series of twenty four (24) interceptor wells are installed east and south of the impoundment to capture potentially impacted groundwater. The impoundment is up gradient from the Green Valley community in relation to the direction of groundwater flow in the regional aquifer.

4. Operations at PDSM have resulted in the formation of a sulfate plume in the underlying aquifer. PDSI has not ascertained fully the vertical and horizontal extent of the sulfate plume. However, PDSI monitors groundwater quality using a series of monitoring wells located approximately 500 to 1000 feet down gradient of the tailings impoundment. Sulfate levels in recent samples from the monitor wells have ranged between 1,000 and 2,000 mg/l, and have remained relatively constant over the last five (5) years. Sulfate levels above 1,000 mg/l are present in the aquifer in an area of approximately five (5) square miles down gradient of the tailings impoundment and the interceptor wells. Three (3) wells are located on the pediment approximately 5,000 feet east of the dam and are periodically sampled by PDSI for sulfate and other constituent concentrations. Samples collected from these wells show sulfate

concentrations in the range of 1,050 to approximately 1,600 mg/l. The actual depth of sulfate contamination has not been ascertained.

5. Down gradient of the PDSM tailing impoundment, Community Water Company (CWC) owns and operates four (4) drinking water production wells, Wells # 6, 7, 8, and 9, which serve a population of approximately 17,000 persons. Samples collected by CWC from Wells # 7 and 8 on February 9, 2005 showed sulfate concentrations of 557 mg/l and 657 mg/l, respectively. Consequently, during June 2005, CWC ceased using Wells # 7 and 8. Therefore, ADEQ has determined that a drinking water source is being or is about to be rendered unusable without treatment.

6. On June 1, 2005, PDSI and CWC entered into an agreement that allowed CWC to temporarily use three (3) PDSI wells (Esperanza Wells 1, 2, and 3) in lieu of CWC's Wells # 7 and 8 that have shown elevated sulfate concentrations. PDSI and CWC have identified two permanent replacement drinking water supply wells, Anamax No.1 Well and CWC Well No. 10, and are currently developing a written agreement for permanent use of these wells to replace the production lost from CWC's Wells # 7 and 8.

7. Neither the Environmental Protection Agency (EPA) nor the State of Arizona provide a Maximum Contaminant Level (MCL) for sulfate in drinking water; however, the EPA provides a Secondary MCL of 250 mg/l that is not federally enforceable, and is based on taste considerations. During February 2003 the EPA published an 'Advisory' that "provides an analysis of the current health hazard information and an evaluation of available data on the organoleptic (i.e., taste and odor) problems associated with sulfate-contaminated water, because organoleptic problems will affect consumer acceptance of water sources." The 'Advisory' recommends reducing sulfate concentrations in drinking water to or below 250 mg/l to address taste considerations. It also recommends a maximum sulfate concentration in drinking water of 500 mg/l to prevent/avoid health based acute effects (absence of laxative effects). This value depends on the absence of other osmotically active materials in drinking water which could lower the sulfate level associated with a laxative effect.

B. Conclusions of Law

1. PDSM is a "facility" pursuant to A.R.S. § 49-201(17).
2. PDSI is a "person" pursuant to A.R.S. § 49-201 (26).
3. Sulfate, a non-hazardous substance, is a pollutant pursuant to A.R.S. § 49-201(28).

4. PDSI would be a responsible party under A.R.S. § 49-283 with respect to discharges containing sulfate from the PDSM facility if sulfate were a hazardous substance.

5. Under A.R.S. § 49-286, because a drinking water source has been or is about to be rendered unusable without treatment due to sulfate concentrations, ADEQ may order PDSI to perform one or more of the following mitigation measures:

- a. Provide an alternative water supply;
- b. Mix or blend if economically practicable;
- c. Economically and technically practicable treatment before ingesting the water;
- d. Other mutually agreeable mitigation measures as are necessary to achieve the purposes of A.R.S. § 49-286.

III. COMPLIANCE SCHEDULE

THE DIRECTOR HEREBY ORDERS and PDSI agrees to comply with the provisions of this Consent Order as follows:

A. Within sixty (60) days of the effective date of this Order, PDSI shall submit to ADEQ a Work Plan designed to complete characterization of the vertical and horizontal extent of the sulfate plume down gradient of PDSM. At a minimum, the Work Plan shall contain the following:

1. A summary of existing information on the characterization of the sulfate plume down gradient of PDSM, including references to known and ongoing characterization and assessment information. PDSI shall submit copies of any referenced final reports to ADEQ.

2. A Quality Assurance Project Plan, with a schedule for implementation, that defines the sulfate plume characterization and assessment objectives, and describes the methods, organization, analyses, and Quality Assurance and Quality Control that PDSI will implement and/or perform to ensure the characterization and assessment objectives are met.

3. A plan, with an implementation schedule that includes site access and permitting requirements and which may include one or more phases, to complete characterization of the vertical and horizontal extent of the sulfate plume down gradient of PDSM. This plan shall include installation, sampling and testing of additional monitor wells necessary to (1) identify the horizontal and vertical extent of the sulfate plume down gradient of PDSM in excess of 250 mg/l, and (2) evaluate the fate and transport of sulfate down gradient of PDSM.

4. A plan to inventory all existing registered private wells used as a drinking water source and public drinking water system wells located within a one (1) mile radius of the sulfate plume's down and cross-gradient outer edge.

B. ADEQ shall notify PDSI in writing if it approves the Work Plan or requires modification of the Work Plan to be consistent with the objectives set forth in Section III.A. Within thirty (30) days of receipt of such written notification from ADEQ or such longer period as may be granted by ADEQ in its discretion, if PDSI has no objections to the required modifications, PDSI shall modify and resubmit the Work Plan to ADEQ. If PDSI objects to the required modifications, PDSI shall employ the dispute resolution prescribed in Section IV. PDSI shall implement the Work Plan upon receipt of written approval of the Work Plan from ADEQ.

C. In accordance with the schedule in the approved Work Plan, PDSI shall submit to ADEQ an Aquifer Characterization Report (ACR) that provides detailed findings pertaining to sulfate concentrations down gradient of PDSM. At a minimum PDSI shall address in the ACR, the following:

1. Current sulfate plume delineation;
2. Sulfate plume fate and transport;
3. Identification of all existing registered private drinking water wells and public drinking water system wells identified by the well inventory required by Section III.A.4; and;
4. An analysis of the effectiveness of PDSI's current groundwater sulfate source control system.

D. In accordance with the schedule in the approved Work Plan and consistent with A.R.S. § 49-286(B), PDSI shall submit a Mitigation Plan to ADEQ for review and approval, which identifies and evaluates alternatives (e.g. containment, collection and discharge with or without treatment, institutional controls, alternative water supplies (including, but not limited to, a new supply well, use of an existing supply well, modifying the screened interval of an existing supply well, connection to an existing public water supply system, and bottled water), mixing or blending, technically practicable treatment, and no action) to practically and cost effectively provide a drinking water supply that meets applicable drinking water quality standards and with sulfate concentrations less than 250 mg/L to the owner/operator of an existing drinking water supply determined from the characterization described in section III.C of this Order and verified

by sampling and analysis to have an average sulfate concentration in excess of 250 mg/L (or other legally enforceable numeric concentration for sulfate which is enacted by statute or rule after the effective date of this Consent Order) as a result of the sulfate plume originating from the PDSM tailing impoundment. The Mitigation Plan shall include a plan for verification sampling and analysis, a method to determine when average sulfate concentrations in a drinking water source exceed 250 mg/l or other applicable numeric concentration for sulfate which is enacted by statute or rule after the effective date of this Consent Order, and a description of a process to confirm that the sulfate concentrations are a result of the sulfate plume from the tailing impoundment based upon the characterization described in section III.C of this Order, which considers the extent of the sulfate plume, background sulfate concentrations, long-term data trends and any other potential sulfate sources. The Mitigation Plan will include recommendations and a schedule for implementation of recommended actions consistent with A.R.S. 49-286 (A) and (B). The Mitigation Plan may use an adaptive management approach that allows for the adjustment of mitigation measures from time to time based upon information obtained concerning the performance of implemented mitigation measures and/or the identification of additional supply wells that could be impacted by sulfate concentrations exceeding 250 mg/L.

E. ADEQ shall notify PDSI in writing if it approves the Mitigation Plan or requires modification of the Mitigation Plan to be consistent with the objectives set forth in Section III.D. Within thirty (30) days of receipt of such written notification from ADEQ or such longer period as may be granted by ADEQ in its discretion, PDSI shall modify and resubmit the Mitigation Plan to ADEQ. Upon receipt of written approval of the Mitigation Plan by ADEQ, and conditioned on written agreement from, or concurrent issuance of an ADEQ order to, the owner/operator of an affected drinking water supply well, PDSI shall implement the Mitigation Plan.

F. Within forty five (45) days of the effective date of this Consent Order, PDSI shall establish a community advisory group (CAG) consisting of at least ten (10) persons, chosen from a cross section of the community, for the purpose of identifying and improving the public's access and understanding of information regarding this Consent Order.

G. Within thirty (30) days of establishing the CAG, PDSI shall present this Consent Order to members of CAG and discuss issues, concerns, and opportunities for expeditious completion of all requirements of this Consent Order.

1. PDSI shall schedule at least four (4) CAG meetings each year to receive briefings, Status Reports, and other pertinent information. PDSI shall provide ADEQ at least fourteen (14) days notice of each scheduled CAG meeting.

2. Within thirty (30) days of establishing the CAG, PDSI in consultation with the CAG, shall coordinate with ADEQ to establish local repositories for the dissemination of information about this Consent Order.

H. Upon written request, ADEQ may grant PDSI additional time to implement the provisions of this Section III if unforeseen circumstances arise. The written request must include a detailed explanation of the reason that additional time is needed, and the date that PDSI expects to complete the work.

I. Nothing in this Consent Order shall in any way limit any agreement between PDSI and CWC described in Section II.A.6 of this Consent Order regarding replacement water supply wells.

IV. DISPUTE RESOLUTION

A. Unless otherwise expressly provided for in this Consent Order, any dispute that arises between PDSI and ADEQ with respect to the Work Plan and the Mitigation Plan described in Section III (hereinafter "Technical Disputes") shall be resolved using the mechanism provided under this Section.

B. Technical Disputes shall in the first instance be subject to informal negotiations between PDSI and ADEQ. The period of informal negotiations shall not exceed twenty business (20) days from the time the dispute arises, unless, via written agreement, PDSI and ADEQ agree to extend this period. The dispute shall be considered to have begun on the date that ADEQ receives, via certified mail, a "Notice of Dispute" from the PDSI. The Notice of Dispute shall toll the time for compliance with Section III until the written decision of the Division Director is made in accordance with paragraph C.

C. In the event PDSI and ADEQ cannot resolve a dispute by informal negotiations, then the position advanced by ADEQ shall be considered binding unless, within thirty (30) days after conclusion of the informal negotiation period, PDSI provides ADEQ's Water Quality Division Director (Division Director) a written statement of position on Technical Dispute, including any factual data, analysis or opinion supporting that position and any other supporting documentation relied upon by PDSI. The Division Director shall issue a final written decision after receipt of PDSI's statement of position. The written decision by the Division Director

shall be final and there shall be no further administrative review, provided that in any action by ADEQ to enforce this Consent Order, PDSI reserves all of its rights to contest the Division Director's decision.

V. STATUS REPORTS

A. PDSI agrees to submit a written Status Report to ADEQ every ninety (90) calendar days from the effective date of this Consent Order, until termination of this Consent Order. At PDSI's request, ADEQ may approve fixed calendar dates for the submission of the Status reports for the previous quarter (e.g., January 31, April 30, July 31 and October 31). Each written Status Report shall describe what measures have been taken under Section III of this Consent Order, and shall certify when compliance with the requirements of Section III of this Order has been achieved. The Status Reports shall be sufficiently detailed to allow ADEQ to determine the effectiveness of PDSI's characterization, remediation and/or all efforts pertaining to execution of the Work Plan. Each Status Report shall be accompanied by evidence of compliance including, as appropriate, submittal of documents, photographs or copies of any other supporting information that PDSI deems necessary.

B. ADEQ will review the Status Reports and relay any disputes, in writing, to PDSI. PDSI shall incorporate all required modifications, changes or other alterations, as requested by ADEQ, within a reasonable time specified by ADEQ.

VI. VIOLATIONS OF ORDER/STIPULATED PENALTIES

A. Under A.R.S. § 49-286, this Consent Order is enforceable under A.R.S. §§ 49-261 and -264.

B. ADEQ and PDSI agree that if PDSI fails to comply with any requirement of this Consent Order, PDSI shall pay a stipulated penalty pursuant to the schedule below:

| <u>Period of Failure to Comply</u> | <u>Penalty Per Day of Violation</u> |
|--|-------------------------------------|
| 1 st to 30 th day | \$5,000 per day per violation |
| 31 st to 60 th day | \$6,500 per day per violation |
| After 60 days | \$8,000 per day per violation |

C. Except as otherwise provided herein, stipulated penalties shall begin to accrue on the day that performance is due or that a violation of this Consent Order occurs and shall continue to accrue until correction of the act of noncompliance is completed. Neither issuance by ADEQ nor receipt by PDSI of a Notice of Violation of the terms and conditions of this Consent Order are conditions precedent to the accrual of stipulated penalties.

D. ADEQ shall notify PDSI in writing of any claim for stipulated penalties under this section. Stipulated penalty payments shall be made pursuant to a civil settlement (e.g., Consent Judgment) with ADEQ filed in a court of competent jurisdiction. If ADEQ and PDSI are unable to reach agreement for payment of stipulated penalties under a civil settlement within a reasonable time after PDSI receives written notice of a claim for stipulated penalties, or if PDSI fails to make payment of stipulated penalties due under a civil settlement, ADEQ may pursue any legal remedy available to it under this Consent Order or applicable Federal or State Law.

E. The stipulated penalties required by this Consent Order shall be in addition to other remedies or sanctions available to ADEQ by reason of any failure by PDSI to comply with the requirements of Federal or State laws, provided that ADEQ may not recover both stipulated penalties under this Consent Order and civil penalties under any other law for the same alleged act or omission. The payment of stipulated penalties shall not relieve PDSI from compliance with the terms and conditions of this Consent Order or Federal or State laws, nor limit the authority of the State to require compliance with the Consent Order or State law.

VII. COMPLIANCE WITH OTHER LAWS

A. This Consent Order does not encompass issues regarding releases, contamination, sources, operations, facilities or processes not expressly covered by the terms of this Consent Order, and is without prejudice to the rights of the State of Arizona or PDSI arising under any federal or Arizona environmental statutes and rules with regard to such issues.

B. Nothing in this Consent Order shall constitute a permit of any kind, or a modification of any permit of any kind, or an agreement to issue a permit of any kind under federal, state or local law, or relieve PDSI in any manner of its obligation to apply for, obtain, and comply with all applicable permits. Nothing in this Consent Order shall in any way alter, modify or revoke federal, state, or local law, or relieve PDSI in any manner of its obligation to comply with such laws. Compliance with the terms of this Consent Order shall not be a defense to any action to enforce any such permits or laws.

VIII. FORCE MAJEURE

A. PDSI shall perform all the requirements of this Consent Order according to the time limits set forth herein, unless performance is prevented or delayed by events which constitute a *force majeure*. *Force majeure*, for the purposes of this Consent Order, is defined as any event arising from causes beyond the control of PDSI or its authorized representatives

which delays or prevents the performance of any obligation under this Consent Order and which could not have been overcome or prevented by PDSI. The financial inability of PDSI to comply with the terms of this Consent Order shall not constitute a *force majeure*.

B. In the event of a *force majeure*, the time for performance of the activity affected by the *force majeure* shall be determined by ADEQ and extended for a period no longer than the delay caused by the *force majeure*. The time for performance of any activity dependent on the delayed activity shall be similarly extended. In the event of a *force majeure*, PDSI shall notify ADEQ in writing within five (5) calendar days after PDSI or its agents become aware of the occurrence. The written notice provided to ADEQ shall describe in detail the event, the anticipated delay, the measures taken and to be taken by PDSI to prevent or minimize delay, and a proposed timetable under which those measures will be implemented. PDSI shall take all reasonable measures to prevent or minimize any delay caused by the *force majeure*. Failure of PDSI to comply with any requirements of this paragraph for a particular event shall preclude PDSI from asserting any claim of *force majeure* for that event.

IX. SITE ACCESS

ADEQ may at any time, upon presentation of credentials to authorized personnel on duty, enter upon the premises at the Facility for the purpose of observing and monitoring compliance with the provisions of this Consent Order. This right of entry shall be in addition to, and not in limitation of or substitution for, ADEQ's rights under applicable law.

X. CORRESPONDENCE

All documents, materials, plans, notices, or other items submitted as a result of this Consent Order shall be transmitted to the addresses specified below:

To ADEQ:

Arizona Department of Environmental Quality
Water Quality Enforcement Unit
Attention: Manager
1110 West Washington Street
Phoenix, Arizona 85007-2935
Telephone: 602-771-4614

To PDSI:

Environmental Manager
Phelps Dodge Sierrita, Inc.
6200 West Duval Mine Road
Green Valley, AZ 85614

And

Manager, Water Quality Programs
Environmental Department
Phelps Dodge Corporation
One North Central Avenue
Phoenix, AZ 85004

Submissions to ADEQ as a result of this Consent Order shall be deemed submitted upon receipt.

XI. RESERVATION OF RIGHTS

A. This Consent Order is based solely upon currently available information. If additional information is discovered which indicates that the actions taken under this Consent Order are or will be inadequate to protect human health, safety, or the environment, or to conform with applicable federal or state laws, ADEQ shall have the right to require further action.

B. ADEQ shall have the right: to pursue civil penalties for violations of any and all provisions of A.R.S. Title 49, or the rules promulgated thereunder, occurring before entry of this Consent Order; to disapprove of work performed by PDSI that fails to comply with this Consent Order; to take enforcement action for any and all violations of this Consent Order; and to take enforcement action for any and all violations of A.R.S. Title 49, or the rules promulgated thereunder, occurring after the entry of this Consent Order.

XII. SEVERABILITY

The provisions of this Consent Order are severable. If any provision of this Consent Order is declared by a court of law to be invalid or unenforceable, all other provisions of this Consent Order shall remain in full force and effect.

XIII. MODIFICATIONS

Any modifications of this Consent Order shall be in writing and must be approved by both PDSI and ADEQ.

XIV. EFFECTIVE DATE

The effective date of this Consent Order shall be the date this Consent Order is signed by ADEQ and PDSI. If such signatures occur on different dates, the later date shall be the effective date of this Consent Order.

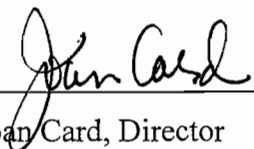
XV. PARTIES BOUND

No change in ownership, corporate status, or partnership status relating to the subject of this Consent Order will in any way alter the responsibilities of PDSI under this Consent Order. PDSI will be responsible, and will remain responsible for carrying out all activities required under this Consent Order.

XVI. TERMINATION

The provisions of this Consent Order shall be deemed satisfied and this Consent Order shall be terminated upon receipt of written notification from ADEQ that PDSI has demonstrated, to the satisfaction of ADEQ, that all of the terms of this Consent Order have been completed. Any denial of a request for termination from PDSI will be in writing and describe which terms of the Consent Order have not been completed to the satisfaction of ADEQ. ADEQ reserves the right to terminate this Consent Order unilaterally at any time for any reason. Any termination will include a written explanation of the reason(s) for termination. This Consent Order shall terminate if ADEQ initiates a civil action under A.R.S. § 49-261 or 262, other than an action to enforce this Consent Order, to require PDSI to take mitigation measures or other measures to address the impacts of the sulfate plume on drinking water sources.

ISSUED this 14th day of June, 2006.



Joan Card, Director

Water Quality Division
Arizona Department of Environmental Quality

CONSENT TO ORDER

The undersigned, on behalf of PDSI, hereby acknowledges that he has read the foregoing Consent Order in its entirety, agrees with the statements made therein, consents to its entry and issuance by the Arizona Department of Environmental Quality, and agrees that PDSI will abide by the same and waive any right to appeal therefrom.

DATED this 8 day of June, 2006.

A handwritten signature in black ink, appearing to read "J. D. Brack", is written over a horizontal line.

John D. Brack

General Manager

Phelps Dodge Sierrita, Inc.

ORIGINAL of the foregoing Consent Order was filed this 15 day of June, 2006, with:

Judith Fought, Hearing Administrator
Office of Administrative Counsel
Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, Arizona 85007-2935

COPY of the foregoing Consent Order was sent certified mail, return receipt requested, this 15 day of June, 2006, to:

Ned Hall
Senior Environmental Engineer
Phelps Dodge Sierrita, Inc.
6200 West Duval Mine Road
Green Valley, AZ 85614

William Cobb, Director
Environmental Department
Phelps Dodge Corporation
One North Central Avenue
Phoenix, AZ 85004

COPIES of the foregoing Consent Order were sent by regular/interdepartmental mail, this 15 day of June, 2006, to the following:

Mark Horlings, Civil Unit Chief
Environmental Enforcement Section
Office of the Attorney General
1275 West Washington Street
Phoenix, Arizona 85007

Michele Robertson, Manager, WQGS, ADEQ

Henry Darwin, Manager, WQCS, ADEQ

Robert Casey, Manager, WQEU, ADEQ

Eric Wilson, Manager, GSTSU, ADEQ

Marty McCarthy, SRO, ADEQ

Dennis Douglas, Director

Pima County Health Department

150 West Congress, Suite 237

Tucson, AZ 85701

Kathi Moore, Chief

CWA Compliance Office (WTR-7)

U.S. EPA, Region IX

75 Hawthorne Street

San Francisco, CA 94105

