



Environmental Remediation Contractors

**STATEMENT
OF
QUALIFICATIONS**

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ROC169357 ROC169358 ROC182680**

VERDAD GROUP, LLC

The principals of Verdad Group, LLC recognize that most environmental investigations have evolved to site remediation and restoration. Large portions of environmental budgets are designated to mandated data collection and repair, operation and maintenance of remediation equipment. Verdad Group, LLC offers two services, defensible environmental data collection, and remedial equipment repair, operation, preventative maintenance and modernization. We are strictly a service-oriented company. We are very familiar with compiling with existing SAP, QAP and site health and safety documents developed for individual remediation sites. In addition, Verdad Group, LLC is experienced in coordinating joint efforts with environmental and engineering consulting firms.

Verdad Group, LLC was formed in 1998 by an environmental hydrologist and an electrical and controls contractor. The owners have over thirty years of combined experience in the environmental arena. We offer the following services: sampling groundwater, surface water, soils, soil vapor, and ambient air; expert repair, operation and maintenance of many modern remedial systems for air, soil and water including: aeration systems, ion exchange units, vapor extraction systems, dual-phase extraction, bio & Insitu remediation, vertical circulation wells, hydrocarbon treatment and free product recovery systems and activated carbon units; and Verdad Group is a full service well maintenance and pump company.

We do not consult; we provide experience, and manpower to assist in keeping data defensible and machinery operational.

All of our staff is 40-hour HAZWOPER and MSHA trained with current certifications.

Permit Compliance and Data Collection

Verdad Group, LLC is experienced with modern data collection standards applicable to permit compliance. We have sampled and compiled data under the watchful eyes of many regulatory agencies including the U.S. Environmental Protection Agency, Air Force Center for Environmental Excellence, Departments of Environmental Quality, California Regional Water Control Boards, and the U.S. Forest Service. We are confident, experienced and resourceful. Verdad Group, LLC can offer a variety of data collection options:

- In house technical training in proper sampling techniques and data compilation
- Environmental data collection for client synthesis and compilation
- Establish protocol and sampling procedures for permit compliance
- Provide turn-key data collection for existing permit compliance programs



VERDAD GROUP, LLC

Environmental Sampling Services

Verdad Group, LLC can offer many environmental contracting services. We are experienced with most sampling devices and methods. We maintain a Smeal 5T pump hoist truck and groundwater sample truck. The pump hoist truck is outfitted with a 5-ton main line winch and a rapid recovery sand line winch for bailing a generator, air compressor and decontamination steam cleaner. Our groundwater sample truck is outfitted with 2" and 4" variable speed submersible pumps mounted on 300 feet of flexible pipe. The truck is equipped with on board decontamination, purge water storage, decontamination water storage and clean water storage. All the staff is 40-hour HAZWOPER certified.

Groundwater Sampling

- submersible pumps: hard wired, remote starting and variable speed
- manual methods: bailers and positive displacement pumps (Trilock)
- turbine line-shaft driven pumps
- bladder and peristaltic pumps
- low flow sampling
- vertical profiling: passive vapor and water

Surface Water / Wastewater Sampling

- open channel (composite and grab)
- impounded water (outfall and column profiling)

Soil Sampling

- split spoon (mechanically and manually driven)
- sediment (bomb and dredge)
- grab (sieve analyses, geologic description)

Remediation Compliance Sampling

- groundwater treatment facilities influent and effluent sampling
- soil vapor extraction influent and effluent sampling
- domestic, residential and potable supply and distribution sampling

Environmental Contractor Supervision

- Well Modifications & Abandonment
- Drilling Supervision

Operational Maintenance and Repair

Verdad Group, LLC is a service company. We offer clients dependable operational maintenance, troubleshooting and repair of any machinery, control instrumentation, computer integrated control system, or software related to regulatory compliance and waste reduction. We have considerable experience operating and maintaining:

- groundwater pump-and-treat systems
- vertical circulation systems
- product recovery
- dual-phase vapor / groundwater systems
- potassium permanganate injection systems



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- bio-remediation systems
- hydrocarbon recovery systems
- vapor recovery and treatment systems
- POTW discharge control and monitoring
- stack gas analytical analyzers, O₂, SO₂, SO₃, NOX, CO, CO₂, N₂, Opacity
- electronic circuit board manufacture waste control and management
- metal plating waste systems
- industrial cooling water systems
- industrial waste water treatment systems

In addition, we offer computer control operations such as:

- computer operations
- plant process control engineering, design, construction, and maintenance
- distributed control systems
- programmable controllers
- personal computer based man-machine interface

Well Maintenance and Pump Installation

Verdad Group is a full service well maintenance and pump company. We install and repair hundreds of submersible pumps per year. We have the equipment and experience to offer groundwater extraction and monitor well rehabilitation and development services. We maintain a large selection of submersible pumps and motors for aquifer testing and development of new wells. Our experience includes the rehabilitation of groundwater wells infected with reducing bacteria's and mineral encrustation blockage. We have developed and refined processes that have greatly improved well production and efficiency.



**PROJECT
EXPERIENCE**



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Treatment System Operational Maintenance and Repair

Groundwater Treatment / Injection Systems

- **Air Force Plant 44, Raytheon Company, Tucson, AZ**
The Raytheon Company, groundwater treatment / injection system receives water from 29 extraction wells. Over 2000 gallons per minute of volatile organic compound (VOC) degraded groundwater are processed through the facility. The facility consists of primary and secondary stripping towers and granular activated carbon (GAC) scrub for vapor effluent emission. The treated effluent is re-injected into the subsurface through 24 recharge wells. The treatment facility is controlled by programmable logic controllers (PLC) that direct speed and frequency of submersible and transfer pump motors through variable frequency drives (VFD). Coordination of the PLC operation is controlled from a personal computer by Human Man Interface (HMI) software. The Raytheon Company treatment system has automated pH control and sand filtration to prevent scaling in the packed aeration towers, holding tanks, distribution pipelines and injection wells. Verdad Group, LLC programmed the HMI software for all the process controls for the Raytheon Company groundwater treatment system.
- **City of Tucson, Environmental Services, Los Reales Landfill Groundwater Treatment System, Tucson, AZ**
Verdad Group, LLC is contracted to operate and provide operational maintenance and repair for the facility. Verdad Group, LLC maintains and repairs the extraction / injection wells, distribution pipelines, plumbing systems, transfer pumps, PLC's, VFD's, flow meters, transducers, pressure filters, granular activated carbon vessels, blower, diffused aeration tank, telemetry and all electrical and computer components. The treatment facility is controlled by PLC's that direct speed and frequency of submersible and transfer pump motors through VFD's. Coordination of the PLC operation is directed through a personal computer by HMI software. The Los Reales Treatment System receives over 40 gpm of VOC degraded groundwater. The groundwater is partitioned through a manifold so extraction wells infected with iron bacteria are injected with sodium hypo chlorite prior to processing. Influent water passes through a closed diffused aeration tank. Air is forced from a blower, through diffuser bars at the bottom of the diffused aeration tank. The diffused aeration tank is chambered; so effluent water is exposed to diffuser bars in four separate areas within the diffused aeration tank. The treated effluent is fed to a holding tank and utilized by on site personnel for dust control or re-injected in to the formation via two injection wells. All effluent vapors are heated and routed through GAC vessels. Verdad Group, LLC samples influent and effluent water and effluent vapor monthly for performance and compliance standards. Verdad Group, LLC is responsible for 24-hour call for system repair.



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- **Arizona Air National Guard Groundwater Treatment System, Tucson, AZ**
Verdad Group, LLC has been contracted to provide operational maintenance and repair for the groundwater treatment system consisting of 8-upper zone extraction wells and 3-lower zone extraction wells. Groundwater is delivered to the treatment system at a rate of 130 gallon per minute. Influent water is degraded with volatile organic compounds and is treated by air stripping. Effluent water is re-injected to the upper zone through 3 injection wells. Verdad Group, LLC is responsible for maintaining and repairing all components of the treatment system, well field and instrumentation / controls components. Verdad Group, LLC collects all compliance samples for treated groundwater and vapor emissions. Verdad Group, LLC is responsible for 24-hour call for system repair.
- **City of Tucson, Environmental Services, Broadway-Pantano Groundwater Treatment System, Tucson, AZ**
Verdad Group, LLC has been contracted to provide operational maintenance and repair for the groundwater treatment system consisting of 2 extraction wells. Groundwater is delivered to the treatment system at a rate of 1300 gallon per minute. Influent water is degraded with volatile organic compounds and is treated through activated carbon. Effluent water is re-injected to the aquifer through 2 injection wells. The injection well flow rates are controlled by BASKI valves operated by nitrogen. Verdad Group, LLC is responsible for maintaining and repairing all components of the treatment system, well field and instrumentation / controls components. Verdad Group, LLC is responsible for 24-hour call for system repair.
- **Conn-Selmer UMI Groundwater Treatment System, Nogales, AZ**
Verdad Group, LLC has been contracted to provide operational maintenance and repair for the groundwater pump and treat system consisting of 1 extraction well. Groundwater flows into the treatment system at approximately 100 gallons per minute. Influent water is degraded with volatile organic compounds and is treated through a series of packed aeration towers. The effluent water is pumped to a storage pond used primarily for irrigation. Verdad Group, LLC has upgraded the system by adding a VFD to the extraction well and streamlines to the PLC logic. In addition, Verdad Group, LLC is responsible effluent sampling and repair call-out.

Dual Phase Extraction

- **Air Force Plant 44, Raytheon Company, Tucson, AZ**
The dual phase extraction wellfield consists of 32 wells. Groundwater from the wellfield is processed through the Raytheon Company groundwater treatment system. Soil vapor is continuously extracted from individual wellheads and routed through a 10,000-pound GAC vessel. Groundwater extraction is sporadic due to low yielding formation. Groundwater withdraws from individual wells is controlled by Motor Saver® devices. The Motor Saver® is programmed to start submersible pump motors at prescribed times, and stops the submersible pump motors when a preset high amperage from the motors indicates the pumps are not lifting groundwater. Instantaneous flow rate and cumulative groundwater pumped is recorded by flow meters at individual wells. Verdad Group, LLC assists Raytheon Company personnel with the operational maintenance and



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repair of the electrical control of submersible pumps, Motor Saver® devices and flow meters for the groundwater withdrawal and the soil vapor extraction system components.

Soil Vapor Extraction – Resin Adsorption / Thermal Regeneration

- **Air Force Plant 44, Raytheon Company, Tucson, AZ**
Verdad Group, LLC provided assistance with operational maintenance and repair of five Resin Adsorption / Thermal Regeneration soil vapor extraction systems. Over thirty vapor extraction wells well connected to each system. Each system consisted of four resin adsorption beds. Blowers, capable of 1000 cubic feet per minute, directed influent vapor to two of the four beds at any one time. The influent vapor was dehumidified and heated prior to introduction to the resin adsorption beds. Influent VOC concentrations determined the amount of time necessary for the resin beds to be loaded. Pneumatic valve actuators would redirect airflow to alternate beds and thermal regeneration would commence. The loaded resin beds were heated and held at temperatures exceeding 300° Fahrenheit. Vacuum pumps removed volatized VOC vapor from the resin beds. The vapor was then chilled, condensed to liquid product and stored in bulk. The loading and regeneration cycle was four-hour process. The loading and regeneration process was controlled by a PLC, which was directed by HMI software. Verdad Group, LLC assisted with daily operational parameter monitoring, operational maintenance of all components of the system and coordinating repair of components by Raytheon Company bargaining unit, labor union trades.

Soil Vapor Extraction – Carbon Treatment

- **City of Tucson, Environmental Services
Harrison Road Soil Vapor Extraction / Air Sparge System**
Verdad Group, LLC provides operational maintenance and repair for all electrical and mechanical components of the soil vapor extraction and air sparge system. The soil vapor extraction system consists of two 25-horse power electric motors and two positive displacement blowers. The air sparge system consists of a 25-horse power electric motor and a positive displacement blower. The system has a water condensation knockout tank with a transfer pump that is activated by high-low switches. Since taking over the system, Verdad Group, LLC has rebuilt and overhauled all the electric motors and blowers. In addition, Verdad Group, LLC maintains all plumbing associated with wellhead maintenance.
- **Air Force Plant 44, Raytheon Company, Tucson, AZ**
Verdad Group, LLC provides assistance to the staff of Raytheon Company for operational maintenance, repair, system parameter monitoring and compliance sampling of four soil vapor extraction (SVE) systems. There are approximately 350 vapor extraction wells associated with the six systems. Three of the SVE units are mobile trailer mounted, and three are fix mounted. Verdad Group, LLC is responsible for quarterly sampling of the vapor extraction wells associated with the six systems.



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Thermal / Catalytic Oxidation Vapor Extraction

- **City of Tucson, Environmental Services
Toole Ave, Price Service Center & Tucson Fire Station No. 10, Tucson, AZ**
Verdad Group, LLC installed and provides operational maintenance and repair of 3 thermal destruction / oxidation hydrocarbon vapor extraction system located for the City of Tucson. The systems consist of a 200-500 cubic feet per minute blowers, extracting petroleum hydrocarbon vapors from vapor extraction wells. The vapors are processed through a natural gas assisted, thermal destruction / oxidation treatment system. Verdad Group, LLC maintains and repairs all components of the system and monitors performance parameters (influent and effluent flow and temperature) including bi-monthly influent and effluent samples. In addition, maintains all the distribution pipelines, wellheads and down well packers.
- **North Star Environmental
Kinder Morgan/Union Pacific, Benson, AZ**
Verdad Group, LLC assisted North Star Environmental start-up operate and maintain a thermal oxidation vapor extraction system. The system was remotely located, without access to utility hook-up. The oxidation system and blowers were operated by propane fueled generators and engines. Verdad Group, LLC provided operational parameter recordings, repairs and as-needed system re-starts.

Petroleum Free Product Recovery Systems

- **City of Tucson, Environmental Services
Tucson Fire Station No. 10, Tucson, AZ**
Verdad Group, LLC provided operational maintenance and repair for a petroleum hydrocarbon free product recovery system located on Tucson Fire Station No. 10 property. The system consists of one well equipped with a pneumatic free product skimmer pump, which pumps free product through an oil/water separator, to a 500-gallon storage tank. In addition, six monitor wells on-site have passive product recovery units installed. Verdad Group, LLC is responsible for maintenance and repair of the oil/water separator, compressor, pneumatic actuators and skimmer pump, semi-monthly free product measurements at 20 well sites, emptying and quantifying product from passive recovery units and supervision of removal of free product from storage tank.

Potassium Permanganate KMnO₄ Injection Systems

- **Air Force Plant 44, Raytheon Company, Tucson, AZ**
Verdad Group, LLC provided supervision and O&M to skid mounted potassium permanganate injection system. The KMnO₄ was in bulk granular form. The system delivered the KMnO₄ to the subsurface through a series of injection wells. Concentrations of the KMnO₄ were regulated by electrical conductance automatically.



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Groundwater Sampling and Non-Dedicated Pump Installation

Dedicated Pump Sampling

- **Air Force Plant 44, Raytheon Company, Tucson, AZ**
Quarterly groundwater sampling of over 150 monitor and extraction wells
- **City of Tucson, Environmental Services,
Los Reales Landfill Groundwater Treatment System, Tucson, AZ**
Semi-annual sampling of 10 on-site extraction wells
- **City of Tucson, Environmental Services,
T. O. Price Service Center, Tucson, AZ**
Annual groundwater sampling of 20 monitor wells
- **City of Tucson, Environmental Services,
T. O. Price Service Center, Tucson, AZ**
Annual groundwater sampling of 20 monitor wells
- **Phelps Dodge Sierrita, Green Valley, AZ,**
Quarterly groundwater sampling of 60 wells

Non-Dedicated Pump Installation and Sampling

- **Air Force Plant 44, Raytheon Company, Tucson, AZ**
Quarterly pump installation and sampling of approximately 25 monitor wells
- **City of Tucson, Environmental Services,
Los Reales Landfill Groundwater Treatment System, Tucson, AZ**
Semi-annual pump installation and sampling of 15 monitor wells
- **City of Tucson, Environmental Services,
Silverbell Landfill, Tucson, AZ**
Quarterly pump installation and sampling of 14 monitor wells
- **City of Tucson, Environmental Services,
Comprehensive Landfill Investigation, Tucson, AZ**
Annual pump installation and sampling of landfill point of compliance wells.

Low Flow and Discrete Interval Sampling

- **Air Force Plant 44, Raytheon Company, Tucson, AZ**
Ten monitor and extraction wells were sampled at up to ten intervals, utilizing temporary installation of Redi-Flow 2 at flows of 0.2 gpm.
- **City of Tucson, Environmental Services,
Silverbell Landfill, Tucson, AZ**
Fifteen monitor and soil extraction wells were sampled utilizing temporary installation of Redi-Flow 2 at flows of 0.2 gpm. Groundwater discharge was monitored continuously until stabilization for pH, conductivity, temperature, dissolved oxygen and oxidation-reduction potential.
- **City of Tucson, Environmental Services,
Los Reales Landfill Groundwater Treatment System, Tucson, AZ**
Staff of Malcolm Pirnie, Inc and Verdad Group, LLC sampled four monitor wells at four discrete intervals using air-actuated sampler.
- **Conn Selmer
Nogales, Arizona**
Fifteen monitor wells sampled quarterly with passive diffusion bags installed at multiple intervals in individual wells.



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Soil Vapor Sampling

- **Air Force Plant 44, Raytheon Company, Tucson, AZ**
Quarterly sampling of over 100 vapor samples. Vapor samples are collected from soil vapor extraction systems, multiple completion vapor extraction wells and remote wells utilizing portable sampling equipment.
- **City of Tucson, Environmental Services,
Los Reales Landfill Groundwater Treatment System, Tucson, AZ**
Monthly treatment system vapor effluent sampling.
- **City of Tucson, Environmental Services,
T. O. Price Service Center, Tucson, AZ**
Semi-weekly treatment system vapor influent and effluent sampling
- **City of Tucson, Environmental Services,
Silverbell Landfill, Tucson, AZ**
Semi-weekly treatment system vapor influent and effluent sampling
- **City of Tucson, Environmental Services,
Toole Avenue, Tucson, AZ**
Monthly treatment system vapor influent and effluent sampling
- **City of Tucson, Tucson Water,
TARP, Tucson, AZ**
Monthly SUMA vapor sampling on carbon vessels



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Well Maintenance and Pump Repair

Verdad Group, LLC has performed new equipment installation, well maintenance, rehabilitation, development abandonment and repairs for the following clients:

AECOM
AFCEE
ASARCO Mission Complex
Barker Morrissey
Carlota Copper Company
Catalina Council, BSA
CH2M Hill
City of Tucson Environmental Services
City of Tucson Parks and Recreation
Tucson Water
Clear Creek Associates
Columbia Analytical Services, Inc.
Conn-Selmer, Inc.
Conestoga-Rovers & Associates
Desert Diamond Casino
E.L. Montgomery & Associates, Inc.
Earth Tech, Inc.
ERM
Freeport McMoRan Sierrita
Freeport McMoRan Ajo
Freeport McMoRan Bisbee
Hydro Geo Chem
INNOVA
MACTEC
Malcolm Pirnie, Inc
Miller Brooks
MWH Americas, Inc.
National Park Service
NorthStar
Pima County Solid Waste
Pima County Wastewater Management
Raytheon Company
Rosemont Copper Company
San Xavier District
SECOR International, Inc
Shell Oil
SRK Consulting, Inc
Tucson Airport Authority
Tucson Water
Twin Buttes Properties
Unisource Energy Corporation
Union Pacific Railroad
University of Arizona
URS Corporation
Water Management Consultants



**PRINCIPAL STAFF
EXPERIENCE**



VERDAD GROUP, LLC

Matthew F. Wallace

Employment

PRINCIPAL Verdad Group, LLC	YEARS EMPLOYED (EX: 1998 -PRESENT) Tucson, Arizona
PROJECT HYDROLOGIST Groundwater Resources Consulting, Inc.	YEARS EMPLOYED (EX: 1990 -2000) Tucson, Arizona
STAFF HYDROLOGIST Groundwater Resources Consulting, Inc.	YEARS EMPLOYED (EX: 1987 - 91) Tucson, Arizona
RESEARCH ASSISTANT University of Arizona, Dept. of Hydrology	YEARS EMPLOYED (EX: 1984 -87) Tucson, Arizona

Education

B.S. Hydrology 1987 University of Arizona Tucson, Arizona

Special Studies and Courses

Environmental Sampling, Water, Gases, Soils and Other Solids, ADHS & ADEQ, 1999

Publications and Papers

Graham, D.D., Allen, T.J., Barackman, M., DeGuisseppi, W.H., Wallace, M.F.
"Trichloroethylene and Dichloroethylene Concentrations in Groundwater Under
Equilibrium Conditions at Air Force Plant 44, Tucson, Arizona, 1999.

Summary of Qualifications

Mr. Wallace is the Co-Owner and Principal of Verdad Group, LLC. Mr. Wallace is the principal point of contact for all contracts held by the firm. He supervises all operational maintenance and repair of remediation systems, compliance sampling of water, vapor and soil, well rehabilitation and submersible pump installations/repair. Mr. Wallace has extensive experience with all forms of operational maintenance of remediation systems including: groundwater pump and treat, soil vapor extraction, fuel recovery and bio-remediation. In addition, Mr. Wallace has a great deal of experience with in-situ oxidation remediation projects, utilizing potassium permanganate.

As a Hydrologist, Mr. Wallace has been involved in many environmental projects in the southwestern United States. His project involvement includes sampling, permitting, closure and corrective actions under state and federal RCRA programs, remedial investigations under state and federal Superfund programs, implementation of remedial measures, landfill investigations and remediation and operational and preventative maintenance of large and small scale groundwater and vapor extraction systems. He is knowledgeable in water and soil sampling techniques and laboratory container and preservative requirements for most analytes including volatile organic compounds, total and dissolved metals, base, neutral and acid compounds (semi-volatile), cation/anion, total petroleum hydrocarbons and radiochemical analysis. He has extensive experience conducting and interpreting soil gas surveys, delineating



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chlorinated solvents and total petroleum hydrocarbons over sites exceeding tens of square miles. Mr. Wallace has experience in baseline studies for watersheds including stream gauging, surface water sampling, diurnal stream flow fluctuations, meteorological data reduction and relating groundwater withdraws to ephemeral stream flow reduction.

Mr. Wallace has many years experience working cooperatively with drilling and support machinery, installing groundwater supply, extraction and injection wells, dual-phase extraction wells, multi-completion piezometers and depth specific soil sampling boreholes. Mr. Wallace is a proficient operator of pump hoist equipment. He owns and operates a pump hoist truck rated at 6-tons. He is the qualifying party for an Arizona Registrar of Contractors L-5 License, qualified for submersible pump installation, repair and well rehabilitation.

Experience

- Provided operational maintenance and repair of groundwater remediation system. System consisted of 10 extraction wells. The influent water was routed through a diffused aeration chamber. Effluent water was routed to a series of injection wells or utilized for dust control at a large landfill. Air emissions were polished in activated carbon. The treatment process was completely automated, utilizing variable frequency drives and programmable logic controllers interfaced with HMI software for City of Tucson, Environmental Management, Tucson, Arizona.
- Provided operational maintenance soil vapor extraction systems exceeding 5000 cubic feet per minute for Raytheon Company.
- Provided operational maintenance and repair for thermal/catalytic oxidation systems from 250 to 500 cubic feet per minute City of Tucson, Environmental Management, Tucson, Arizona.
- Provided operational maintenance and repair for soil vapor extraction systems incorporated with resin regeneration treatment beds systems (PADRE) from 2000 to 10,000 cubic feet per minute for Raytheon Company, Tucson, Arizona.
- Provided operational maintenance and repair for total fuel recovery systems City of Tucson, Environmental Management, Tucson, Arizona.
- Operation of 6-ton pump hoist truck for the installation of dedicated and temporary submersible pumps.
- Operation of 6-ton pump hoist truck in support of chemical and mechanical well rehabilitation.
- Trouble shoot and repair of submersible pumps, including 2-inch Redi-Flow pump systems.
- Hydrologic field data compilation, synthesis, interpretation, and report presentation for VSI VOI-SHAN Aerospace, Redondo Beach, CA; VOI-SHAN Levinson Facility, Porterville, CA; Boeing North American, Inc., Rocketdyne



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Facility, Canoga Park, CA; and Raytheon Missile Systems Company, Tucson AZ.

- Provided in-house technical support for large scale groundwater extraction / recharge project. Responsibilities included data collection, synthesis and report preparation in support of state and federal permits. Coordinate and supervise scheduled and unscheduled O & M for groundwater and soil vapor treatment systems; maintenance of groundwater monitor, extraction and recharge well fields for Raytheon Missile Systems Company, Tucson, AZ.
- Coordinated and supervised resourceful groundwater and soil vapor sampling techniques including low-flow sampling, vertical profiling, and dual-phase (groundwater/ soil vapor) sampling for Raytheon Missile Systems Company, Tucson, AZ.
- Provided technical review and revision of SAP and QAP documentation for Raytheon Missile Systems Company, Tucson, AZ.
- Coordinated and supervised the installation and aquifer testing of monitor wells, extraction wells and injection wells for groundwater and soil vapor projects in Arizona and California.
- Collection, compilation, and presentation of hydrologic field data for three EPA Superfund sites in Arizona.
- Preparation and implementation of NPDES Permit for VOI-SHAN Levinson Facility, Porterville, CA and Carlota Copper Mine, Globe, AZ.
- Supervision of neutron moisture probe operation and data interpretation for Raytheon Missile Systems Company, Tucson, AZ.
- Soil sampling and lithologic interpretation, Raytheon Missile Systems Company, Tucson, AZ; Boeing North American, Inc., Rocketdyne Division, DeSoto and Canoga Park Facilities.
- Free product thickness measurements for fuels and benzene, utilizing interface probe and transparent bailer
- Supervision and interpretation of soil gas surveys, VOI-SHAN Levinson Facility, Porterville, CA; Boeing North American, Inc., Rocketdyne Facility, Canoga Park, CA.
- Supervision of monitor well construction and implementation of groundwater monitoring plan for three landfill sites for Pima County Environmental Department, Tucson, AZ.
- Supervision of installation of dual-phase groundwater/vapor monitor wells, Raytheon Missile Systems Company, Tucson, AZ.
- Provided in-house training for the Raytheon Environmental Group in proper groundwater and soil vapor sampling techniques, sample handling, field data



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interpretation, and groundwater and soil vapor well field maintenance.

- Water well construction supervision of the following drilling techniques: augers, cable tool, air and mud direct rotary, and air rotary casing hammer.



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Wilbur 'Bill' J. Taylor, Jr.

Employment

Principal Verdad Group, LLC	YEARS EMPLOYED (Ex: 1998 -Present) Tucson, Arizona
OWNER Taylor Controls	YEARS EMPLOYED (EX: 1989 -PRESENT) Tucson, Arizona
CONTROLS ENGINEER Denzer and Wilson Engineers	YEARS EMPLOYED (EX: 1987 - 89) Tucson, Arizona
JOURNEYMAN INSTRUMENT REPAIRMAN Arizona Public Service Co., Saguaro Power Plant	YEARS EMPLOYED (EX: 1984 -87) Red Rock, Arizona
JOURNEYMAN INSTRUMENT MECHANIC Magma Copper Co. San Manuel, AZ	YEARS EMPLOYED (EX: 1976 -82)

Experience

Air Force Plant 44 (Raytheon Company Co), Tucson, Arizona.

For over fourteen years, Mr. Taylor has been responsible to maintain and program all plant control systems and electrical equipment for the Ground Water Treatment Facility. This plant uses Soil Vapor Extraction, Air Stripping, Vertical Circulation, Puris PADRE systems, Ion Exchange, Direct Recharge Pump and Treat and Carbon Adsorption. Mr. Taylor assisted in several University of Arizona remediation studies. Replacement of the control system computers using 2 Allen-Bradley PLC5s and 2 HMI workstations; each running Intouch Wonderware® software. All user software was written by Mr. Taylor from scratch with an employee drawing graphics on the HMI. This project was completed with almost no downtime due to system switch over. Mr. Taylor's work leads him to all O&M aspects of this plant.

Mr. Taylor is responsible for the Industrial Waste Treatment Facility for the past 13 years, to maintain and program all plant control systems and electrical equipment. The plant uses liquid pretreatment technologies, sand pressure filters, Ultra Filtration, Reverse Osmosis, Electro Dialysis Reversal, Christalization, ORP for chromium reduction, Ion Exchange and Spray drying. Control system consists of six Allen-Bradley PLC5s, five Allen-Bradley SLC500 PLCs, five Workstations using Intouch Wonderware® HMI software and 3 Allen-Bradley 1400 Touch screen HMI interfaces.

City of Tucson, Environmental Management

Maintenance of all controls, PLC and VFDs at Los Reales pump and treat system including mechanical maintenance of system equipment. Maintenance of blowers and controls at Harrison Landfill SVE system. Installation of vertical circulation well equipment at Silverbell landfill. Blower maintenance at Silverbell landfill. Repair of Paragon thermal destruction unit at Price service center.



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Blaes Environmental Remediation Systems

Basin and Range Hydrogeologists

Repair of Paragon thermal destruction unit, combustor controls and blowers.

Repair of Thermox thermal destruction units, combustor controls and blowers.

URS Inc.

Installation of remote monitoring systems for Arizona Army National Guard.

Repairs to Oil/Water separators.

Installation and maintenance of SVE systems.

Maintenance of PLC and Computer controls for wet carbon / air stripping pump and treat systems.

Arizona Portland Cement Co.

Rillito, AZ

For the over 14 years Mr. Taylor has engineered, built and programmed many control systems using General Electric PLC's.

BHP Copper San Manuel, AZ

Installation and calibration of instrumentation including HMI programming.

Philadelphia Thermal Energy Co.

Philadelphia, PA

Responsible for technical support and PLC programming for control system and MMI retrofit on Natural gas and Oil fired boilers and steam distribution system.

Magma Copper Co.

San Manuel, AZ

Operation, maintenance and calibration of all control system components, primarily pneumatic controllers and control valves, PLC's and electronic controls.

City of Tucson, Environmental Services

Tucson, AZ

Operational maintenance and repair of groundwater pump and treat systems, soil vapor extraction systems, wellfield operations and petroleum hydrocarbon free product recovery systems. Mr. Taylor has made modifications to existing systems that increase productivity while decreasing maintenance costs.

