V. 5. HAND BOOK ON PRESSURIZED IRRIGATION pdf

1: Handbook on pressurized irrigation techniques.

Dynamic pressure is the pressure when water is flowing in the system. Dynamic pressure in a system can be Dynamic pressure in a system can be determined by flow tests, using pressure gauges or by calculation if information on pipe types and sizes, valves.

Passive treatment approach Vryheid Coronation Colliery VCC ceased operations in and has no existing infrastructure. To mitigate the potential for acid mine drainage some form of treatment to improve discharge water quality is required. Since this is a defunct operation, desalination using reverse osmosis was deemed inappropriate and other passive solutions were sought. Passive treatment using biological reactors to remediate sulphate-rich water was considered suitable; particularly since there has been a substantial drive in the development of passive systems for the treatment of persistent low flow mine impacted water, now seen as longterm sustainable solutions that can be implemented. They mitigate the requirement for major infrastructure and sophisticated levels of operational maintenance with a minimisation of waste generation and also reducing the carbon footprint of the process. Passive treatment offers a number of advantages over conventional active systems as chemical addition and energy consumption are virtually eliminated and there is the potential for community involvement, thereby providing assurance that the water issue is managed effectively into the future. A passive bio-neutralisation process is currently under development based on the principles demonstrated in a Coaltech project at Middelburg mine. The residue, a daily one million litres of brine, was securely stored in a deep underground compartment. This has been done with the recent construction of two brine evaporation ponds, built at a cost of R million. The mine was publicly recognised both for the implementation of this project and its day-to-day water management practices, including its continuous efforts to comply with environmental legislation following an audit by the Blue Scorpions. The DWS unit is responsible for enforcing the National Water Act and, among other things, clamps down on water-related crimes, including industrial pollution, the dumping of solid waste and illegal water use. Driving efficiency with WETT Kriel colliery is testing manmade wetlands in the treatment of water at source through naturally occurring biochemical processes. Coal South Africa has committed to achieving an overall saving of These range from the installation of water-saving aerators on taps in offices and workshops, water-efficient showerheads in change houses and the lining of water storage dams, to the large-scale adaptation of coal processing plants. This will see the dewatering of low quality slimes residue emanating from the plant prior to disposal, a move that presents important advances in the environmental management of mineral waste. Significant quantities of water reclaimed in the filtration process will be reused in the plants, substantially minimising the amount required from external sources. Industry needs another large portion - there is not much left over for the humans and animals. It is life threatening! A one-time investment for the next 20 or more years. The effective and economic use of the little water that is left to mankind has been the main idea for the water future system â€" through the development of our porous pipe for the subsurface irrigation which is now found in most countries around the globe. Borehole water often contains iron. The AquaKat avoids or where existing eliminates these problems. No plumbing, electricity or maintenance. Life Span at least 15 years. Available in many sizes from single taps, houses, industry, farms, large apartment blocks, camping sites,lodges and parks etc. As more Algae as lesser oxygen in the water and easy conversion to eutrophic water. Water must be healthy and energetic for animals, plants and us humans. Disributors welcome, also companies or investors for Water Future System plant for South Africa or anywhere else in Africa. Other benefits include a reduction in air space and the resultant ability to store greater volumes in a single facility as well as limiting the risk of potential environmental liabilities, including seepage. The project is a precursor to the possible briquetting of in situ slimes to convert waste into a usable product. The Australian design is based on the filter feeding mechanism of the baleen whale and was installed at the operation at a cost of R With savings of an estimated 2 m3 of water a month, New Vaal expects to yield a payback in eight years. In addition, Goedehoop has installed a R1. Continuous miner cutter heads are equipped with fine water sprays which act as a cooling agent to reduce the potential of frictional ignition while at the same time minimising

worker exposure to dust. Instead of using a potable source, as was previously the case, the plant cleans underground mine water which is continually reclaimed and recycled. It is anticipated that this will bring about savings of million litres every year. These partners jointly undertake waterrelated investigations and projects, pooling their resources of capital and expertise and benefiting from the accompanying economies of scale. Co-funded by the five parties, the initiative saw the updating of the existing Highveld Coalfields Water Study for the development of a water resources and management database for the coalfields region. Recognising the critical role that water plays as a catalyst for both economic growth and social development, the DWS forged a partnership with the Water Resources Group, an influential public-private global network on water supported by the World Economic Forum and the International Finance Corporation. This will oversee the activities of the SWPN, which seeks to address critical water issues in South Africa, including water conservation, demand management and developing the more sustainable management of groundwater resources. The results are innovations that go far beyond the statutory requirements, thereby setting new standards for the market. It lies within legal requirements with a ratio of between Q1 and Q3. This unique design, consisting of a rectangular cross section, optimized stainless steel electrodes and a homogeneous magnetic CASE STUDY field, forms the basis for a flow-optimizing pipe cross section, and thereby provides reliable measurements that are largely independent of the flow profile. This has an obvious advantage: Another advantage is that you can customize the measuring frequency specifically to your application, thus ensuring that the measurement results are always accurate, even when the flows are changing quickly. Major cost savings in installation and maintenance Pricing is always an important criterion in the selection of a meter. Increasingly companies focus on the total cost of ownership including the purchase price, the costs of inaccuracy, under registration, and installation and maintenance costs. Typical mechanical meters have internal moving parts and are subject to wear and their performance deteriorates over time. Electromagnetic water meters maintain their accuracy over time and due to their robust construction the time spent on routine maintenance and service activities can be reduced to a minimum. Wear of mechanical meters results in under registrations and thus lower revenues for the company providing water. In the worst case there is not registration at all. Being obstruction free also offers another important benefit as electromagnetic flow meters only cause negligible pressure loss in the distribution network. A major drawback of mechanical water meters is that they have difficulties with accurate measurements of low flows and with large variations in flow rates. If the chosen size of a water meter is too high, flow rate will be relatively too low leading to significant under registrations. If a meter is undersized it will frequently operate at high flow rates and will degrade much faster. Its high turndown ratio allows for accurate metering during day and night. In the water industry, we have over 85 years of experience in metrology to draw on, and we have continuously set new standards in this technology. KROHNE is a full-service provider for process measuring technology for the measurement of flow, mass flow, level, pressure and temperature as well as analytical tasks. Founded in and headquartered in Duisburg, Germany, the company employs over 3, people all over the world and is present on all continents. KROHNE stands for innovation and maximum product quality and is one of the market leaders in industrial process measuring technology. Stefan Fourie, Watercare Mining Precipitation is a frequently applied treatment process for removal of metals and anions such as calcium, magnesium, sulphate, fluoride and phosphates from process and wastewater. Precipitation is also widely used within the mining and metallurgical industry for metal recovery, AMD-treatment and water softening. In general, the sludge produced in such precipitation units is of poor quality, therefore disabling reuse of the sludge. An advanced alternative for conventional precipitation is crystallisation in fluidisedbed type crystallisers. This technology was developed originally by RHDHV and the Water Works of Amsterdam in the s as a cost-effective technology for the central softening of drinking water. More recently, this zero-waste technology has also been recognised by the mining and metallurgical sector as a costeffective and sustainable proven technology for use in treatment schemes such as extraction, mine service water treatment, acid mine drainage AMD , ground water fissure water and wastewater. The technology has been piloted and proven in South Africa by Watercare Mining to be a valid alternative to conventional processes. Technology description The chemistry of the process is comparable to conventional precipitation. By dosing a suitable reagent to the water, the solubility of the target component is

exceeded and subsequently it is transformed from the aqueous solution into solid crystal material. The primary difference with conventional precipitation is that in the crystallisation process the transformation is controlled accurately and that pellets with a typical size of approximately 1mm are produced instead of fine dispersed, microscopic sludge particles. The water is pumped in an upward direction, maintaining the pellet bed in a fluidised state. In order to crystallise the target component on the pellet bed, a driving force is created by a reagent dosage and sometimes also pHadjustment. By selecting the appropriate process conditions, co-crystallisation of impurities is minimised and high-purity crystals are obtained. Due to their excellent composition, the pellets are normally recycled or reused in other plants, resulting in no residual waste for disposal. In the rare event that pellets have to be disposed of by other means, the advantage of low-volume secondary waste production still remains: Furthermore, high surface loadings are applied and subsequently the crystallisation unit is compact. This is contrary to the excess lime consumption necessary for conventional cold lime softening and therefore boasts greater economic feasibility. Re-use of pellets Dependent on the composition of the feed stock, the pellets can be re-used for various applications. For example, by calcining the CaCO3 pebbles produced during softening, a high purity burnt lime is produced. Various other uses include applications in the mining, pulp and paper, agriculture and petrochemical industries. Combination with other technologies Combination with other desalination processes such as ion exchange and membrane technologies allows for the possible development of true zero liquid discharge processes. Furthermore, complex effluents generally require piloting before a guaranteed solution can be implemented. In addition, it offers an alternative to sodium cycle softening processes for domestic and industrial use. The zerowaste and cost-effectiveness characteristics of this technology make it a truly sustainable solution. These are typically the mountain catchments contained in a number of CapeNature nature reserves across the Western Cape, such as the Cederberg, the Boland and the Outeniqua Mountains. It goes without saying that without water, the Western Cape and its people, and indeed the whole world, would be a much poorer place. Normal run-off and water yield from a typical fynbos mountain catchment is maximised by the fact that a natural and healthy run-off process is maintained. When trees are added, the situation changes quite dramatically, starting with the fact that on average, a mature tree, say a pine tree, consumes approximately litres of water per tree per day. In , Dye, Olbrich and Everson established that the greatest impact on water yield from a healthy mountain catchment area occurs when seasonally dormant vegetation, such as fynbos, is replaced by evergreen plants, such as invasive pine trees. Thus, where grasslands or shrublands like fynbos are invaded by alien trees, the overall water use by the vegetation increases, leaving less water for the streams, and consequently for the enduser. This technically means that the water yield or run-off process has been significantly affected. Alien and invasive species The first ecological process in our mountain catchment areas is alien and invasive species. The current estimate is that invasive aliens cover approximately 10 million hectares in South Africa, and use approximately 3. These estimates indicate that the reduction in water yield is already significant and definitely large enough to warrant intervention. The logical conclusion is that these water losses will increase as alien plants invade the remaining, uninvaded areas. It is therefore in the interests of healthy catchments and the people of a region that immediate and decisive action is taken to protect the sustainability of water yield from South African catchments. Fire The second important ecological process in our catchments is fire. Because fynbos in the Western Cape region is a fire-driven ecosystem, fire remains a very important and necessary process. Fynbos requires fire to survive and to rejuvenate itself and without fire, fynbos dies.

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2: HP High Pressure Self-Priming Irrigation Pump | Big Sprinkler

The handbook on pressurized irrigation techniques is a joint effort of the Water development and management Unit of FAO (NRLW) and of the International Programme for technology and research in irrigation and.

Device to control flow. Valves used in pressurized systems include: Outlet valve attached to the top of a short vertical pipe riser with an opening equal in diameter to the inside diameter of the riser pipe and an adjustable lid or cover to control water flow. A ring around the outside of the valve frame provides a seat and seal for a portable hydrant. Typically used in border or basin irrigation. Valve configured with its outlet oriented 90 degrees from its inlet. Device that releases air from a pipeline automatically without permitting loss of water. NRCS, air vacuum, air relief: Device that releases air from a pipeline automatically without permitting loss of water or admits air automatically if the internal pressure becomes less than atmospheric. NRCS, back flow prevention: Check valve that allows flow in one direction. NRCS, See specific valve for details. Valve in a pipeline used to start or stop flow by rotating a sealed ball with a transverse hole approximately equal to the diameter of the pipeline. Ball rotation is typically 90 degrees for a single-port control Valve with an internally mounted ball with a hole in the center for water to pass through. Rotation of the ball one-fourth turn opens and closes the valve. Valve in a pipeline to start or stop flow by rotating a disk 90 degrees. The disk is about the same diameter as the pipeline. Valve used in a pipeline which allows flow in only one direction. Valve especially designed to be used with the injection of chemicals in an irrigation system. Quarter turn valve similar to a ball valve with two exceptions. Internally there is a circular disk rather than a ball, and there is no attached handle. Rochester, curb stop: Physically the same as corporation valve but used at a different location. Spring loaded valve that automatically opens and drains the line when the pressure drops to near zero. Valve on the end of a line to flush out dirt and debris. May be incorporated into an end plug or cap. NRCS, float valve: Valve, actuated by a float, that automatically controls the flow of water. NRCS, foot valve: Check valve used on the bottom of the suction pipe to retain the water in the pump when it is not in operation. NRCS, flow control: Valve with automatically adjusts to provide a predetermined downstream flow. Valve in a pipeline used to start or stop water flow. May be operated by hand with or with mechanical assistance or by high or low voltage solenoid electric controlled mechanical assistance. Gate valves consist of seated slide or gates operated perpendicular to the flow of water. Head loss through a gate valve is typically less than a globe valve, but more than a ball or butterfly valve. Globe valves stop flow by positioning a disk and gasket over a machined seat about the same diameter as the pipe. Globe valves are limited to smaller sizes because of the high velocities and very high head loss through the valve. Irrigation zone valve which uses small flexible tubes and water under pressure to provide the actuation signal from the controller to the valve. Any mechanical valve used to isolate a section of a piping system. Valve used to protect the landscape from flooding in case of a ruptured main or malfunctioning downstream valve. The master valve is installed on the mainline after the backflow preventer in some systems. Rain Bird, orchard: Outlet valve installed inside a short vertical pipe riser with an adjustable cover or lid for flow control. Similar to an alfalfa valve, but with lower flow capacity. Typically used in basin irrigation. Small valve used to actuate a larger one. Valve designed to automatically provide a preset downstream pressure in a hydraulic system. Spring loaded valve set to open at a pressure slightly above the operating pressure, used to relieve excessive pressure and surges. NRCS, pressure sustaining: Valve designed to provide a minimum preset upstream pressure. Permanently installed valve which allows direct access to the irrigation mainline. A quick coupling key is used to open the valve. Rain Bird, remote control: Valve which is actuated by an automatic controller by electric or hydraulic means. Synonymous with Automatic Control Valve. Rain Bird, surge: Device in a pipe T fitting to provide flow in alternate directions at timed intervals. Used in surge irrigation. NRCS, swing check: Valve used to prevent a vacuum in pipelines and avoid collapsing of thin-wall pipe. ASAE, valve-in-head sprinkler: Usually refers to the average velocity computed as flow rate per unit area of a pipe. Is the speed at which water moves through the system pipe. Monroe, velocity head: Ratio of the volume of voids pores to the volume of soil. Force required to push and pull a stream of electrons through a circuit. Derryberry, Amount of electrical potential

required to force one amp of current flow in a circuit against one ohm of resistance. Refers to the flow path of water and its associated pump casing as it leaves the impeller of a pump. A method to accurately and fairly estimate a total volume of water that should be allocated to a site. Factor used in the equation to predict Water allotment. Predicting, water application efficiency: See soil-water content water conveyance efficiency: Phenomenon which occurs when the velocity of water flowing in pipelines is rapidly changed, usually by a rapid or sudden gate or valve closure, starting or stopping of a pump, or sudden release of air. Usually the result of a fast-closing or opening valve. Rain Bird, water pressure: Total amount of water held in the soil per increment of depth. It is the amount of water held between field capacity and oven dry moisture level. NRCS, water horsepower water power: State administered legal rights to use water supplies derived from common law, court decisions, or statutory enactments. NRCS, water storage efficiency: Upper surface of a saturated zone below the soil surface where the water is at atmospheric pressure. NRCS, water use efficiency: Time of day available for irrigation to occur. Rain Bird, weir: Flow measuring device for open-channel flow. Weirs can be either sharp-crested or broad-crested. Flow opening may be rectangular, triangular, trapezoidal cipolletti , or specially shaped to make the discharge linear with flow depth sutro weir. Calibration is based on laboratory ratings. Weight of soil sample and included soil moisture. Surface area wetted at completion of irrigation. Landscape, wetted diameter: Preferred term diameter of throw. Chemical used to reduce the surface tension of a liquid causing it to make better contact with the desired target. See permanent wilting point. Process of removing water from the irrigation system before the onset of freezing temperatures. One of several standard units of measure for wire size. The larger the gauge number, the smaller the wire.

3: The Sustainable Water Resource Handbook Vol 5 - Alive2green by Alive2Green - Issuu

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Imagining Brazil: the recruitment of English labourers as Brazilian colonos Oliver Marshall Electrical engineering principles and applications 5. Behold this compost Wait for an answer Constable: reverence. Renewing the spirit of national and community service Exposition of Romans Community Development Around the World Towards the liberation of archaeological praxis in a / Atlas of Adult Electroencephalography Pt. 2. On Dennett. Minds, brains, and tools Andy Clark ; Reply to Clark Daniel Dennett ; Discussion The lives and times of archy and mehitabel Transparent user authentication Into Your Digital Darkroom Step by Step Three-D Art Projects That Teach Executing stategy Hungarian dance no 5 piano duet Hearing disorders The Sociology of American Drug Use Vaults, mirrors, and masks The Rough Guide to New Zealand 5 Bruce Webers Inside Baseball, 1992 Adaptive Inventions: The Elegance of Self-Regulation Under His Spell (The Bounty Hunter) Lets do the time warp : welcome to the punk musical film cycle Figure 47. Grasping waist of trousers for inflation 47 Hands That Built New Hampshire A Practical Guide to Equal Opportunities Boss of Brightlands The marketing battleground : past, present, and future The Wings of Democracy Plant design and economics for chemical engineers book Ancient egyptian ornament in full color Gerald Fitzgerald, the chevalier Handbook of behavior food and nutrition Economic Development in the Soviet Union and Eastern Europe (Praeger special studies in international pol More theatre games for young performers Through Grandpas Eyes Disciplines of disciples Let Go and Let God