
CURRICULUM VITAE SURINA ESTERHUYSE

E D U C A T I O N A L H I S T O R Y

- 2020 Phd Environmental Management. Title: "Towards a regulatory framework to protect groundwater resources during and as a result of unconventional oil and gas extraction", University of the Free State, promotors: D. Vermeulen (UFS), J. Glazewski (UCT).
- 2002-2004 MSc Hydrogeology
Institute for Groundwater Studies, University of the Free State, South Africa
- 2000 BSc Honours Hydrogeology Cum Laude
Institute for Groundwater Studies, University of the Free State, South Africa
- 1999 BSc Geology Cum Laude
University of the Free State, South Africa
-

P U B L I C A T I O N R E C O R D

Peer-reviewed papers:

Quartile 1 journals:

- Esterhuyse, S., Vermeulen, D. and Glazewski, J. 2020. Getting fracking regulations right to protect groundwater resources. *Water research*. Submitted (Q1: Environmental Engineering, Environmental Sciences, Water Resources, IF: 9.13)
- Esterhuyse, S., Vermeulen, D. and Glazewski, J. 2019. Regulations to protect groundwater resources during unconventional oil and gas extraction using fracking. *Wiley Interdisciplinary reviews: Water*, 6(6): e1382. (Q1: Environmental sciences, Water Resources, IF: 4.451)
- Esterhuyse, S., Avenant, M., Redelinghuys, N., Kijko, A., Glazewski, J., Plit, L., Kemp, M., Smit, A., Vos, A.T. 2017. Monitoring of Unconventional oil and gas extraction and its policy implications. *Energy Policy*, 118:109-120. (Q1: Energy & Fuels, Environmental Sciences, Environmental studies, IF: 5.042)
- Esterhuyse, S., Avenant, M., Redelinghuys, N., Kijko, A., Glazewski, J., Plit, L., Kemp, M., Smit, A., Vos, A.T., Williamson, R. 2016. A review of biophysical and socio-economic effects of unconventional oil and gas extraction - implications for South Africa. *Journal of Environmental Management*, 184(2):419-430 (Q1: Environmental sciences, IF: 5.647)

Quartile 2 journals:

- Mulovhedzi, A, Esterhuyse, S. 2020. Groundwater resources monitoring during unconventional oil and gas extraction: South African laboratory analytical capabilities. *Journal of Water Resources Planning and Management*. Submitted. (Q2: Civil Engineering, Water Resources, IF: 2.4)
- Williamson, R. and Esterhuyse, S. 2020. Expected wastewater volumes associated with unconventional oil and gas extraction in South Africa and the management thereof. *Bulletin of Engineering Geology and the Environment*, 79(2), 711-728. Doi: 10.1007/s10064-019-01578-y. (Q2: Environmental Engineering, Geological Engineering, Multidisciplinary Geosciences, IF: 3.041). Supervised student.
- Ihemba, S. and Esterhuyse, S. 2020. Assessing the sustainability of permitted irrigation from groundwater in the Grootfontein-Tsumeb-Otavi Subterranean Water Control Area in Namibia. *Groundwater for Sustainable Development*. 10: 100295 (Q2: Environmental Engineering, Water Science and Technology, Geography, Planning and Development, IF: 1.802). Supervised student.
- Esterhuyse, S., Avenant, M., Redelinghuys, N., Kijko, A., Glazewski, J., Plit, L., Kemp, M., Smit, A., Vos, A.T. 2017. Vulnerability mapping to manage oil and gas extraction. *Royal Society Open Science*, 4(11), p.171044. (Q2: Multidisciplinary sciences IF: 2.647)

- Esterhuysen, S., Redelinghuys, N., Kemp, M. 2016. Unconventional oil and gas extraction in South Africa: water linkages within the population-environment-development nexus and its policy implications. *Water International special edition - Out of Mines, Out of Site: The water legacies of conventional mining*, 41(3):409-425 DOI:10.1080/02508060.2016.1129725 (Q2: Civil Engineering, Water Resources, IF: 1.899)
- Brooks, D.B., Nickum, J.E., Turton, A and Esterhuysen, S., 2016. Introduction to *Water International special issue: Out of Mines, Out of Site*. *Water International special edition - Out of Mines, Out of Site: The water legacies of conventional mining*, 41(3):325-329 DOI:10.1080/02508060.2016.1161487 (Q2: Civil Engineering, Water Resources, IF: 1.899)
- Esterhuysen, S., Redelinghuys, N., Kemp, M. 2013. Assessing the existing knowledge base and opinions of decision makers on the regulation and monitoring of unconventional gas mining in South Africa. *Water International*, 38(6), 687-700. Doi: 10.1080/02508060.2013.818478. (Q2: Civil Engineering, Water Resources, IF: 1.899)

Quartile 3 journals:

- Hohne, D., Esterhuysen, C., Fourie, F, Gericke, H. and Esterhuysen, S. 2020. Enhancing groundwater recharge in the Main Karoo, South Africa during periods of drought through Managed Aquifer Recharge. *Journal of African Earth Sciences*. In press. (Q3: Multidisciplinary geosciences, Interdisciplinary geosciences, IF: 1.403)
- Hohne, D., de Lange, F., Esterhuysen, S., Sherwood-Lollar, B. 2019. Case study: methane gas in a groundwater system located in a dolerite ring structure in the Karoo basin, South Africa, 2019, *South African Journal of Geology*, 122(3): 357-368. (Q3: Geology, IF: 1.119)
- Esterhuysen, S. 2017. Developing a groundwater vulnerability map for unconventional oil and gas extraction: a case study from South Africa. *Environmental Earth Sciences*. Published online. DOI: 10.1007/s12665-017-6961-6. (Q3: Environmental Sciences. Multidisciplinary geosciences, Water resources IF: 2.180)
- Buschke, F.T., Avenant, M.F., Esterhuysen, S., Kemp, M.E., Kruger, F.J., Ololade, O.O., Seaman, M.T., Vos, A.T., Watson, M. 2016. Producing the next generation of water resource experts in South Africa. *S Afr J Sci*. 2016;112(3/4), Art. #a0145, 4 pages. <http://dx.doi.org/10.17159/sajs.2016/a0145> (Q3: Multidisciplinary sciences IF: 1.866)

Quartile 4 journals:

- Prucha, B., Graham, D., Watson, M., Avenant, M., Esterhuysen, S., Joubert, A., Kemp, M., King, J., le Roux, P., Redelinghuys, N., Rossouw, L., Rowntree, K., Seaman, M., Sokolic, F., van Rensburg, L., van der Waal, B., Van Tol, J., Vos, T. 2016. MIKE-SHE integrated groundwater and surface water model used to simulate scenario hydrology for input to DRAFT-ARID: the Mokolo River case study. *Water SA* 42(3):384-398. (Q4: Water resources IF: 1.094)
- Seaman, M., Watson, M., Avenant, M., King, J., Joubert, A., Barker, C., Esterhuysen, S., Graham, D., Kemp, M., Prucha, B., Redelinghuys, N., Rossouw, L., Rowntree, K., Sokolic, F., van Rensburg, L., van der Waal, B., Van Tol, J., Vos, T. 2016. DRIFT-ARID: A method for assessing environmental water requirements (EWRs) for non-perennial rivers. *Water SA* 42(3):356-366. (Q4: Water resources IF: 1.094)
- Seaman, M., Watson, M., Avenant, M., King, J., Joubert, A., Barker, C., Esterhuysen, S., Graham, D., Kemp, M., Prucha, B., Redelinghuys, N., Rossouw, L., Rowntree, K., Sokolic, f., van Resnburg, L., van der Waal, B., Van Tol, J., Vos, T. 2016. DRIFT-ARID: Application of a method for environmental water requirements (EWRs) in a non-perennial river (Mokolo River) in South Africa. *Water SA* 42(3):368-382. (Q4: Water resources IF: 1.094)
- Esterhuysen, S and Redelinghuys, N. 2014. Knowledge on unconventional gas mining among decision-makers in South Africa: exploring the requirements for fact based water policy development. *Water Policy*, 16(6), 1155-1171. (Q4: Water Resources, IF: 1.093)
- Falko T Buschke, Surina Esterhuysen, Marthie E Kemp, Maitland T Seaman, Luc Brendonck, Bram Vanschoenwinkel. 2013. The dynamics of mountain rock pools - Are aquatic and terrestrial habitats alternative stable states? *Acta Oecologica*, 47, 24-29 (Q4: Ecology IF: 1.220)

Buschke, FT and Esterhuysen, S. 2012. The perceptions of research values and priorities in water resource management from the 3rd Orange River Basin Symposium. *Water SA*, 38 (2), 249-253. (Q4: Water resources IF: 1.094)

New journals:

Esterhuysen, S. 2018. Identifying the risks and opportunities of unconventional oil and gas extraction using the strategic environmental assessment. *Current opinion in Environmental Science and Health*, 3: 33-39. (SJR: 1.316. Current Opinion in Environmental Science & Health is a new journal that is part of the "Current Opinion" titles. It invites top experts to write short reviews on current advances in their field.)

Conference proceedings:

Esterhuysen, S. 2011. Towards the effective national regulation of organic groundwater contaminants in South Africa. In: International conference on groundwater, incorporating the Biennial groundwater conference and the meetings of the International Association of Hydrogeologists, ISBN: 978-0-620-50725-7.

D.M. van Tonder, H. Coetzee, S. Esterhuysen, L. Strachan, P. Wade, S. Mudau. 2009. South Africa's Challenges Pertaining to Mine Closure – development and implementation of regional mining and closure strategies. In: Mine closure 2009 - Proceedings of the fourth international seminar on mine closure, Australian Centre for Geomechanics, University of Western Australia, ISBN: 978-0-9804185-9-0, pp. 79-91.

D.M. van Tonder, H. Coetzee, S. Esterhuysen, N. Msezane, L. Strachan, P. Wade, T. Mafanya, S. Mudau. 2008. South Africa's Challenges Pertaining to Mine Closure: The Concept of Regional Mining and Closure Strategies. In: Proceedings of the third international seminar on mine closure, Mine closure 2008, A.B. Fourie, M. Tibbett, I.M. Weiersbye, P. Dye (eds), 14-17 October 2008, Johannesburg, South Africa, Australian Centre for Geomechanics, University of Western Australia, Perth, ISBN: 978-0-9804185-6-9, pp. 87-98.

Chapters in books:

Esterhuysen, S. and Buschke, F. 2020. Coal and water: Exploiting one precious natural resource at the expense of another? In: Marais, L., Burger, P., Campbell, M., Denoon-Stevens, S., Van Rooyen, D (Eds.). *Coal and energy in Emalahleni, South Africa: Considering a just transition*. Edinburgh University press. In press.

Schreiner, G.O., De Jager, M.J., Snyman-Van der Walt, L., Dlodla, A., Lochner, P.A., Wright, J. G., Scholes, R.J., Atkinson, D., Hardcastle, P., Kotze, H., Esterhuysen, S. 2018. 'Evidence-based and participatory processes in support of shale gas policy development in South Africa'. In Whitton, J., Cotton, M., Charnley-Parry, I.M. & Brasier, K. (Eds.) *Governing Shale Gas: Development, Citizen Participation and Decision Making in the US, Canada, Australia and Europe*. London, UK: Routledge.

Ololade, O., Esterhuysen, S., Levine, A.D. 2017. The Water-energy-food nexus from a South African Perspective. In: *Water-Energy-Food Nexus: Theories and Practices*. AGU/Wiley publishers.

Brooks, D.B., Nickum, J.E., Turton, A., Esterhuysen, S. 2017. Water legacies of conventional mining: Introduction. *The Water legacies of conventional mining (Routledge special issues on Water Policy and Governance)*. ISBN: 978-1138288713.

Esterhuysen, S., Redelinghuys, N and Kemp, M. 2017. Unconventional oil and gas extraction in South Africa: water linkages within the population–environment–development nexus and its policy implications. *The Water legacies of conventional mining (Routledge special issues on Water Policy and Governance)*. ISBN: 978-1138288713.

Esterhuysen, S., Kemp, M. and Redelinghuys, N. 2017. Assessing the existing knowledge base and opinions of decision makers on the regulation and monitoring of unconventional gas mining in South Africa. *The Water legacies of conventional mining (Routledge special issues on Water Policy and Governance)*. ISBN: 978-1138288713.

- Esterhuysen, S., De Lange, S.S. and Glazewski, J. 2016. Potential impact of Unconventional Oil and Gas Extraction on Karoo Aquifers. In: Hydraulic fracturing in the Karoo: Critical legal and environmental perspectives. Juta Publishers. ISBN: 978-1-48511-818-3.
- Glazewski, J. and Esterhuysen, S. 2016. Introduction: Setting the Scene. In: Hydraulic fracturing in the Karoo: Critical legal and environmental perspectives. Juta Publishers. ISBN: 978-1-48511-818-3.
- Kijko, A., Kahle, B., Smit, A., Esterhuysen, S., Glazewski, J. 2016. Hydraulic Fracturing, Waste-Water Pumping and Seismicity. In: Hydraulic fracturing in the Karoo: Critical legal and environmental perspectives. Juta Publishers. ISBN: 978-1-48511-818-3.
- Avenant, M., Watson, M., Esterhuysen, S., Seaman, M. 2016. Potential impact of unconventional gas mining on surface water systems of the Karoo basin. In: Hydraulic fracturing in the Karoo: Critical legal and environmental perspectives. Juta Publishers. ISBN: 978-1-48511-818-3.
- Hobbs, P., Day, E., Rosewarne, P., Esterhuysen, S., Schulze, R., Day, J., Ewart-Smith, J., Kemp, M., Rivers-Moore, N., Coetzee, H., Hohne, D., Maherry, A. and Mosetsho, M. 2016. SGD Chapter 5: Water Resources. In: Shale Gas Development in the Central Karoo: A scientific assessment of the opportunities and risks. ISBN: 978-0-7988-5631-7.
- Burns, M., Atkinson, D., Barker, O., Davis, C., Dunlop, A., Esterhuysen, S., Hobbs, P., Manuel, J., McLachlan, I., Neethling, H., Rossouw, N., Todd, S., van der Walt, L., van Huyssteen, E., Adams, S., de Jager, M., Scholes, B. 2016. SGD Chapter 1: Scenarios and Activities. In: Shale Gas Development in the Central Karoo: A scientific assessment of the opportunities and risks. ISBN: 978-0-7988-5631-7.

Book reviews:

- Esterhuysen, S. 2020. Regulating water security in unconventional oil and gas: edited by Regina M. Buono, Elena Lopéz Gunn, Jennifer McKay and Chad Staddon, Cham, Switzerland, Springer, 2019, 418 pp., € 119.99 (hardback), € 96.29 (ebook), ISBN 978-3-030-18342-4. *Water International*, 45(2): 142-144

Peer-reviewed publications:

- Esterhuysen, S., Avenant, M., Watson, M., Redelinghuys, N., Kijko, A., Glazewski, J., Plit, L. A., Kemp, M., Smit, A., Sokolic, F., Vos, A.T., Reynolds, D., Von Maltitz, M., Van Tol, J., Bragg, C., Van Soelen, B. and Ouzman, S. 2014. Development of an interactive vulnerability map and monitoring framework to assess the potential environmental impact of unconventional oil and gas extraction by means of hydraulic fracturing. WRC Report No. 2149/1/14. ISBN 978-1-4312-0589-9.
- Seaman, M.T., Watson, M., Avenant, M.F., Barker, C.H., Buschke, F., Dennis, I., Esterhuysen, S., Joubert, A., Kemp, M., King, J., Le Roux, P., Redelinghuys, N., Rossouw, L., Rowntree, K., Sokolic, F., van der Waal, B., Van Rensburg, L., Van Tol, J., Vos, A.T. 2010. Deliverable 8: Report on Catchment delineation, Site selection and Fieldwork for the Mokolo River Case Study. Testing a prototype methodology for Environmental Water Assessments in Non-perennial Rivers. Water Research Commission contract K5/1798. Centre for Environmental Management, University of the Free State. South Africa.
- Department of Minerals and Energy. In press. 2009. Regional Mine Closure Strategy for the East Rand Goldfield, Mine Environmental Management Series
- Department of Minerals and Energy. In press. 2009. Regional Gold mining closure strategy for the Witwatersrand Basin, Mine Environmental Management Series
- Department of Minerals and Energy. In press. 2009. Geo-Environmental Model of the O'kiep Copper mining district, Mine Environmental Management Series

Popular publications

- Esterhuysen, S., Vermeulen D., Glazewski, J. 2019. Protecting groundwater resources during fracking. *Advanced Science News*. <https://www.advancedsciencenews.com/protecting-groundwater-resources-during-fracking/>
- Esterhuysen, S. November 16, 2017. Groundwater maps could help South Africa prepare for safer fracking. <https://theconversation.com/groundwater-maps-could-help-south-africa-prepare->

for-safer-fracking-87269. The second article in a series of six articles that The Conversation Africa ran on shale gas. Republished in Mail and Guardian, African Independent.

Esterhuysen, S. December 19, 2017. Fracking and earthquakes: weighing up the dangers in South Africa. <https://theconversation.com/fracking-and-earthquakes-weighing-up-the-dangers-in-south-africa-87541>. The third article in a series of six articles that The Conversation Africa ran on shale gas. Republished in The Citizen, African Independent, African Mining Brief, Phys.org.