

Gaffney
Cline

Russia Caspian Expertise



About GaffneyCline

GaffneyCline is a global consultancy that has been offering technical, commercial, and strategic advice to the oil and gas sector since 1962. GaffneyCline's reputation demonstrates that its advice, along with its insight, is high-quality, impartial, technically based, and commercially astute. GaffneyCline is often referred to as one of the leading Reserves consultants within the industry, but in reality, GaffneyCline offers a full range of upstream, midstream and downstream technical and commercial consultancy services. These range from seismic interpretation, static and dynamic reservoir modelling, field development planning, field engineering, gas monetisation, LNG/GTL, expert witness, mergers and acquisition, economics and project finance. GaffneyCline operates worldwide from three main offices in London, Houston and Singapore, and from regional offices located in Buenos Aires, Sydney and Moscow.

GaffneyCline Russia Caspian Experience

GaffneyCline has been working with leading organizations in Russia and Caspian region countries since 1993, serving a wide range of local and international clients, from oil and gas companies to banks and international financial organizations. The geographical coverage of GaffneyCline projects includes all major oil and gas basins across Russia, from mature Caspian to frontier North Sakhalin, as well as other Caspian region countries: Azerbaijan, Kazakhstan and Turkmenistan. The scope of these projects has been very diverse, including field development planning and implementation, asset acquisition, refinery and gas processing plant audits, government strategy, dispute assistance and a wide range of oil and gas Reserves and Resource audits and evaluations.

Brief summaries of a limited selection of these projects are provided below.

Our Experience

Super-giant gas field reserves update in Turkmenistan

The aims of the project were to update the static and dynamic field models previously built by GaffneyCline and simulate forward production. The work consisted of the seismic data, new wells and production data analysis. This work was crucial in assisting the client establish the total reserve volume in the field and how much is likely to be recovered from the different production areas of the super-giant gas field.

Audit of EPC Contractor's Work

On behalf of a Caspian-region national gas company, GaffneyCline was engaged to review the work carried out by the EPC Contractor responsible for the development of a commercial-scale Gas-to-Gasoline plant. In addition to assessing whether the contractor had built what it was contracted to provide, GaffneyCline also considered whether the Contractor had designed and built what was needed to satisfy international and local standards of engineering design, safety and environmental protection. Additionally, consideration was given as to the technology that had been utilized and whether an appropriate technological approach had been adopted for the plant in line with the standards applicable to the plant being constructed. A detailed assessment was made as to the equipment, spare parts, documentation, procedures and manuals procured, installed and provided by the Contractor in the context of what was contractually expected. Areas where it was felt the Contractor may have fallen short in its performance were flagged to GaffneyCline's client, to act as the basis for discussions aimed at closing out the issues raised.

Technical Due Diligence: Western Siberia

GaffneyCline executed the technical due diligence of a tight oil field in Nazym area, Western Siberia for a Middle Eastern Oil Company. GaffneyCline evaluated the subsurface technical risks and strategic assumptions in the valuation. Correlative benchmarking of project costs against similar developments in the area was a key part of the due diligence.

Corporate Acquisition Due Diligence: Eastern Siberia

GaffneyCline acted as a Technical Consultant in support of a potential acquisition of an interest in an independent Russian oil company holding oil and gas assets. GaffneyCline attended a data room and led the evaluation of all subsurface data. The work included an audit of the geoscience, petroleum engineering and commercial aspects of the project to derive resource estimates and NPVs.

Major Gas Field Review, Northern Russia

On behalf of a major Russian bank and as part of a Lending Document preparation, GaffneyCline has performed a detailed review of a major gas field at a very early stage of development, located in Northern Russia. The review has been done in a close collaboration with the operational and management teams of the field operator. The work included, amongst others, a detailed analysis of critical points of the field development: drilling schedule, equipment and all the drilling related contractors' capabilities.

GaffneyCline Projects in Russia



Our Experience

Reserves, Technical and Commercial Advisor: Sakhalin

Since 1999 GaffneyCline has been providing technical and commercial advice to the Group of LNG buyers and Lenders to the Sakhalin-II project. The project involved the development of three large oil and gas condensate fields located offshore Sakhalin Island and construction of pipelines, an LNG plant and associated export facilities.

EOR Evaluation: Fractured Carbonate Field

GaffneyCline was engaged to assess a range of optimal enhanced oil recovery (EOR) techniques for the Usinskoye heavy oil field in Komi region of Russia using a multivariate simulation approach. The objective was to enhance oil production and to reduce development costs in a complex and challenging subsurface reservoir. A pilot program focussed on fracture characterisation, volumetric sweep, 3-phase saturations, target oil production and injection rates.

Technical Advisor: Two Significant Portfolio Sales

GaffneyCline audited the development and production plans of two major asset portfolios in the preparation of materials for a corporate acquisition. The assurance involved the identification of upside potential and the evaluation of risk for the purchaser and included considerable direct field work in support of the sale process.

Unconventional Reservoir Development: Western Siberia

GaffneyCline performed an integrated assessment of the technical and commercial development potential of the Upper Jurassic Bazhenov shale. This included geomechanical modelling and designing the optimum completion technique for horizontal wells in the pilot study area.

Opportunity Profiling and Strategic Advice: Russian Acquisitions

GaffneyCline conducted a profiling of acquisition opportunities in Russia. A range of indicators were developed which allowed the client to consider all strategic options, to define critical corporate value drivers, and identify the optimal suite of assets for potential acquisition.

Improved Productivity Assessment: Oil Field, Russian Arctic

GaffneyCline was requested to complete an independent audit of an Engineering, Procurement and Construction (EPC) contract and its progress at the start of a crucial winter construction season for an undeveloped oil field in the Russian Arctic. GaffneyCline identified a number of critical issues (staffing, project planning software, critical path analysis, and project management processes) and generated potential solutions which the JV management was able to raise with the Contractor to ensure the project aligned with the original schedule.

LNG Joint Venture: Russian Arctic

GaffneyCline conducted an independent audit of the resource volumes in a large gas-condensate field located in the Russian Arctic. GaffneyCline also conducted an economic evaluation of participation in the development and LNG project.

Environmental and Business Review of Corporate Technical Capability

On behalf of the European Bank of Reconstruction and Development (EBRD) who were considering issuing a loan to a Russian service company, GaffneyCline carried out a review of the company's technical capabilities and plans to expand into new service areas. The work included an audit of the company's environmental practices and business plans.

PRMS Reserves and Resources Evaluation: Western Siberia

GaffneyCline conducted an audit of the oil and gas Reserves and Contingent Resources for a Western Siberian portfolio. This involved a review of newly constructed static and dynamic reservoir models. A series of workshops helped mentor the Client through SPE-PRMS compliant methodology for resource classification.

Competent Person's Report for Successful AIM Listing

GaffneyCline prepared a Competent Person's Report (CPR) on assets in Timan-Pechora and Volga-Urals basins as part of a successful Initial Public Offering (IPO) on the Alternative Investment Market (AIM) of the London Stock Exchange (LSE).

Stock Exchange Listing of KazMunaiGas E&P

For the Initial Public Offering (IPO) of KazMunaiGas E&P on the London and Kazakh Stock Exchanges, GaffneyCline provided the Competent Person's Report (CPR) in support of that listing. This work involved the provision of an independent Reserve and Value opinion on the entire KMG EP portfolio, together with considerable coordination between the Banks, the Stock Exchange and KMG E&P. The listing raised nearly \$2.5 billion, and GaffneyCline has undertaken annual reserve updates for many years since that time.

Acquisition Due Diligence

A major international Joint Venture retained GaffneyCline to undertake due diligence on three Kazakh assets, including an exploration block, a producing licence and a major pipeline, in order to support the client in a possible acquisition. GaffneyCline visited the data room and carried out a range of sub-surface, engineering, cost and economic reviews of all assets in order to generate asset valuations for use by the client in their bid process.

Our Experience

Technical Audit of the Kashagan Field

As part of a potential corporate re-organization of KMG, GaffneyCline was appointed as KMG's Reserve and Technical Advisor to review the reserves, resources and field development plans of the giant Kashagan field and four smaller satellite discoveries. The field is the subject of one of the largest international oilfield investments, located offshore in the northern Caspian Sea. Working closely with the clients' Financial Advisers, GaffneyCline reviewed the operator's static and dynamic models, and the main project risks, including gas sales versus injection, construction, operations and sulphur disposal. The scope of work included site visits during facilities construction.

Independent Technical and Commercial Evaluation of Karachaganak Field

GaffneyCline provided a detailed assessment of the giant Karachaganak field on behalf of KMG and the Lenders, in support of an equity acquisition. The work included an audit of the Operator's static and dynamic models, to determine future production potential under a range of potential redevelopment options, an analysis of future CAPEX and OPEX and development schedules for each of these options, plus preparation of appropriate cashflow forecasts to support the Lender's valuation of the asset. This involved close cooperation with the Operator, including site visits, discussion and analysis of future development potential, assessment of export constraints and examination of alternative gas utilisation options. GaffneyCline provided independent cost estimates for each option as a check on the operator's own estimates.

Insurance Assessment

GaffneyCline was commissioned by a firm of insurance underwriters to carry out an independent well site survey. The survey included a review of drilling and producing wells to assess blowout and pollution risks for insurance underwriting purposes. GaffneyCline also evaluated the operating conditions, the type and specification of well equipment, and the procedures and practices utilised to ensure safe operating conditions.

Subsurface Technical Analysis

On behalf of a non-operating independent company, GaffneyCline reviewed the geology, seismic interpretation, petrophysics, fluid analysis and production test results for a thermal pilot in two deep heavy-oil deposits in eastern Kazakhstan. The review resulted in alternative interpretations for the seismic analysis and static model, and identified petrophysical factors which helped to explain the production test results. Recommendations for improved testing and alternative production technology were provided.

Technical Opinion Acquisition

On behalf of a Private Equity Fund, GaffneyCline reviewed the Prospective Resources of a block in the Pre-Caspian Basin from a geological and economic perspective, with a view to a possible acquisition. The work included an assessment of the validity of previous seismic interpretations, prospects and leads generated, as well as volumetric assessments. An economic analysis was then undertaken on the Prospective Resources, with a range of assumptions applied. Recommendations concerning the commercial viability of these prospects were made based on this analysis.

Associated Gas Utilization Study

GaffneyCline conducted an associated gas utilization concept and feasibility study for a new field development on behalf of an independent oil company. GaffneyCline assessed various options for the handling of gas volumes which exceeded requirements for in-field needs and offtake via limited sales gas exports. The study also focused on short-term utilization for peak gas production with flaring not an option. The work involved identification and screening of gas utilization options; pure commercialization options were considered, as were hybrid options which might improve on-site gas management, including in-field and utility load demands. Options considered included: local community schemes, product exports (including power generation, GTL and domestic industrial fuel), as well as gas storage to conserve gas for use later in the PSA's life.

GaffneyCline used a series of screening and analysis steps to filter unsuitable gas utilization options, leading ultimately to one proposed recommendation that best satisfied agreed selection criteria. Throughout the work, progress on narrowing down possible gas utilization solutions was facilitated by regular workshops with the client to discuss solutions and shortlist options.

GaffneyCline Russia Caspian Region Projects

Job Category	Number of Jobs
Block/Asset Review	66
Reserves	59
Field Development Studies	30
Arbitration/Expert Opinion	18
Gas Utilization	13
Geoscience Assistance	4
Other	14
Total	203

Our Experience

Improved Productivity Assessment

GaffneyCline was engaged by a Russia-based international oil company to benchmark their operations in Kazakhstan in terms of reservoir characteristics and performance. GaffneyCline reviewed the operational and reservoir information for the three assets in question and then benchmarked these assets against other international fields based on GaffneyCline's experience and databases. GaffneyCline provided guidance and recommendation as to potential improvements in operation and development of the fields based on the assessment and concluded the study with a workshop to the client explaining in detail potential improvements to their technical personnel.

Field Redevelopment and Rehabilitation, Uzen Field

Although over 10 years ago, a significant project reflecting GaffneyCline's country expertise was undertaken by GaffneyCline for the national oil company and under World Bank funding, to provide a 20-man team of staff to work both in the UK and in Kazakhstan to develop plans for, and to supervise the implementation of, a pilot rehabilitation of a block in the giant Uzen oil field. This resulted in a doubling of oil production, a major review of all operating procedures that has been transferred to the rest of the oil field.

The work involved joint GaffneyCline/client teams to re-map selected parts of the field as a prelude to redesigning the water-flood scheme and to planning a major work-over programme. In addition, a significant programme of overhaul and rehabilitation of the surface facilities was designed.

Annual Reserves Update

For an independent operator, GaffneyCline conducted multiple year end independent evaluations of the client's reserve estimates for a series of fields in Western Kazakhstan. GaffneyCline's work was based on well and reservoir data plus field performance and the client's five year business plan.

Technical Due Diligence of an Oil Field, Kazakhstan

As part of a pre-acquisition technical due diligence GaffneyCline was retained by a Private Wealth Fund to review a complex oil field with limited and challenging data, located in Western Kazakhstan. The field comprised of both pre-salt and post-salt reservoirs and had a long history of production. The advice received from GaffneyCline allowed the client to form a strategy with regards to the asset acquisition.

Caspian Region Petroleum Sector Study

GaffneyCline provided the UK Department of Trade and Industry with an analysis of the Caspian Region's petroleum sector history, current activities and opportunities (particularly Azerbaijan and Kazakhstan). This study was updated to examine the progress of subsequent projects and to provide an analysis of new opportunities.

A Review of Caspian Region Crude Oil Export Pipeline Projects

GaffneyCline was engaged to identify and review the major potential crude oil export pipeline projects proposed from the southern Caspian region. These projects, if they come to fruition, would have an impact on the future trade and profitability of the client's facilities and related infrastructure.

For each of the identified projects, GaffneyCline reviewed the political and economic risks associated with each pipeline, and ranked the projects on the likelihood of project completion. In addition, GaffneyCline assessed the potential impact of each project on the trade and profitability of the client's facilities.

Evaluation of Exploration Concession, Pre-Caspian Basin

A major European conglomerate commissioned GaffneyCline to carry out an evaluation of a proposed exploration concession in the Pre-Caspian basin. GaffneyCline determined the type, nature and depth of potential hydrocarbon accumulations, and defined a practical exploration programme to evaluate this potential. Exploration and development cost scenarios were scoped to provide realistic economic screening of conceptual opportunities and to provide an outline basis for the potential negotiation of the economic aspects of an exploration concession.

Acquisition Review Offshore Caspian

For an oil company considering the option of a JV partnership, GaffneyCline examined a potential asset acquisition in the Russian offshore Caspian which included fields straddling the Kazakh border. The work examined both oil production and longer term gas export schemes.

Reserves Update

GaffneyCline was retained by an independent oil development and production company to perform a Reserves update for certain fields in the Caspian region, after two years of further production, drilling and data collection. GaffneyCline checked the validity of seismic and geological models based on recent well results, performed checks on petrophysical interpretations, reviewed production records and field development plans and verified oil and gas recovery factors. In addition, GaffneyCline updated existing cash flow models for economic limit testing.

Field Development Peer Review

On behalf of a large Russian bank, GaffneyCline undertook a peer-review of a field development project for several gas condensate fields located in the Volga-Urals Basin in order to support a loan to a small independent operator. The operator planned to expand production that involved doubling of a gas processing plant capacity and building of a 250 km long pipeline. GaffneyCline conducted a peer review of the field development report including reservoir characterization, static and dynamic models, in-place volumes, reservoir engineering, production profiles, facilities, CAPEX and OPEX profiles, project schedule, key project uncertainties and risks.

Our Experience

Audit of Work Programme, Caspian

For a National Oil Company in conjunction with its financial auditor, and based on the previous year's activities, GaffneyCline supported the Audit of the Work Programme for a large offshore Caspian oil field complex. GaffneyCline provided technical advice and audit of a large annual work programme and budget for a development which involved an on-going phased construction project as well existing Early Production Facilities. The satisfaction of the client led to GaffneyCline's continued annual involvement on this project.

Review/Valuation of Surface Facilities, Mangistau, Kazakhstan

For an international oil company planning to purchase an interest in an oil field in the Kazakhstan's Mangistau region, GaffneyCline undertook a technical audit and valuation of the surface facilities. This work was required to support the financing of the project.

Acquisition Due Diligence, Kazakhstan

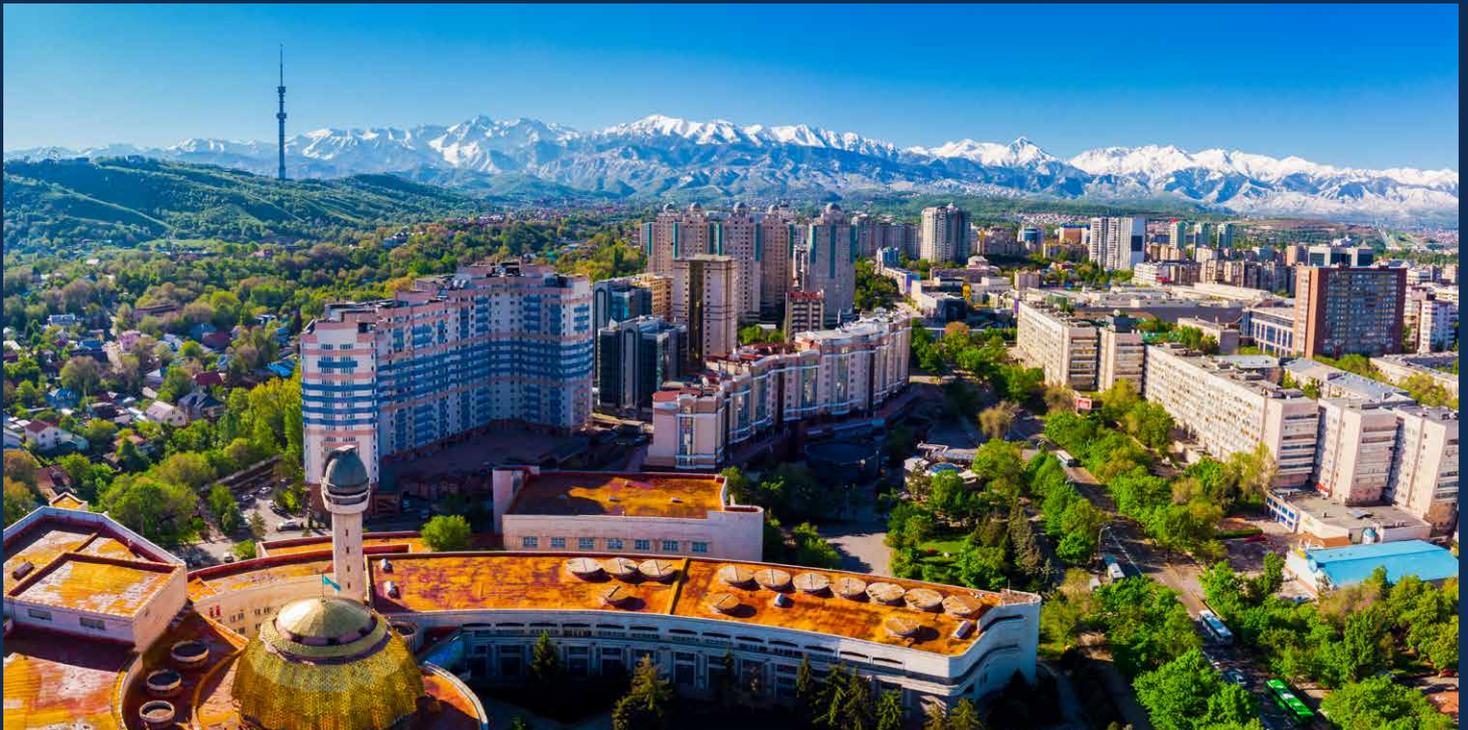
A major international Joint Venture retained GaffneyCline to undertake due diligence on three Kazakh assets, including an exploration block, a producing licence and a major pipeline, in order to support the client in a potential acquisition. GaffneyCline visited the dataroom and carried out a range of sub-surface, engineering, cost and economic reviews of all assets in order to generate a range of asset valuations for use by the client in its bid process.

Reserve/Resource Audit, Kazakhstan

GaffneyCline performed an independent audit under SPE PRMS classification of the petroleum assets (Reserves, Contingent Resources and Prospective Resources) for two national oil companies. These assets comprised nine producing properties, fields under development and licensed exploration interests located in the North Caspian Basin, onshore, western Kazakhstan. Production profiles for each company were generated and NPVs were developed for several scenarios. These values were used by the client during acquisition negotiations.

Modernisation of Condensate Refinery

GaffneyCline reviewed the performance of a large gas processing complex and condensate refinery in Astrakhan on the Russian Caspian. GaffneyCline considered all aspects of the processing complex's and the refinery's performance, including corrosion, process control, fired-heaters, environmental problems and safety. In conjunction with a regional market study, GaffneyCline produced a future development strategy. A number of projects were identified for implementation via immediate, short, medium and long-term strategies. In addition, a complete management restructuring and financial reporting system upgrade study was completed.



Our Experience

Shah Deniz Gas Field Expansion Project

In 2016 GaffneyCline acted on behalf of a lender and a borrower involved in the US\$30 billion Shah Deniz Phase 2 development for purposes connected with project finance. The purpose of the Shah Deniz Phase 2 development was to expand field production by an additional 10 Billion Cubic Metres of gas per year (BCMA). This detailed, multi-disciplinary study involved reviewing the geology, reservoir engineering, wells and facilities, project execution strategy, operations plans, capital and operating cost forecasts and economics of this very large and high profile project. This work updated reports previously generated in connection with the same development for the same lender, carried out by GaffneyCline two years previously with an identical scope and to the same level of detail.

Assistance with Joint Venture Project, Kazakhstan

GaffneyCline was contracted to assist in a potential Joint Venture project including three oilfields located onshore in western Kazakhstan. GaffneyCline undertook an NPV assessment that was used as the basis for a valuation of the three oil fields. GaffneyCline's role also encompassed the provision of general advice on developing and managing JVs.

Audit, Operating Plan and Operations Support

GaffneyCline was requested by an independent oil company to assess the operational status of existing oilfield assets in Turkmenistan and to prepare an operating plan for field development and production. GaffneyCline assigned a multi-disciplined team to conduct an in-depth study of all available data and to compare this with its own practical investigations in the field. The client was provided with a full description of existing operations including field transportation, loading and general infrastructure and with operating conditions and capacities where applicable. GaffneyCline subsequently provided full management support and directed technical operations in Turkmenistan to progress the field development and attain commercial realisation on behalf of the client. This included a Reserves audit and a formal report.

Annual Work Programme and Budget Audit

GaffneyCline was contracted to provide technical and commercial advice to a State Oil Company on its annual work programme and budget for an offshore project in the Caspian, operated by an International Major. GaffneyCline audited the proposed capital and operating expenditure budget, and the work programme for a three-phase project, of which two phases were complete and operational. GaffneyCline performed a high level peer review and provided a comparative benchmark of costs and, as a basis for the appraisal of the cost escalations, presented in the budget. The key performance indicators of the project were compared with international project expectations and GaffneyCline commented on the project risk perceptions and contingency levels. GaffneyCline's staff worked closely with the project's financial auditors, presenting the findings to both top-level government officials and technical sub-committees.

Technical Audits and Reviews of AIOC'S Annual Work Programmes and Budgets for ACG Project

For a number of years, GaffneyCline carried out a series of detailed technical audits of Azerbaijan International Operating Company's (AIOC's) Work Programme and Budget for the Azeri-Chirag-Gunashli (ACG) development. GaffneyCline's work involved performance reviews, concept and design reviews and budget reviews. During this work GaffneyCline acted as Technical Adviser to a large British accountancy and business advisory company which had a contract with SOFAZ (the State Oil Fund of Azerbaijan) and with the Azeri State Oil Company, SOCAR.

Review of Hydrocarbon Interests Offshore Turkmenistan

GaffneyCline provided technical and economic support to Dragon Oil PLC, an independent oil company, in acquiring an equity interest in a petroleum venture, offshore Turkmenistan. The scope of GaffneyCline's work included contract terms/environmental considerations, reservoir evaluation, development plans, basis of Reserves estimation, hydrocarbons-in-place, Reserves and economic evaluation. A Competent Person's Report was prepared for a Rights Issue and Listing Document on the London and Dublin Stock Exchanges. GaffneyCline has since provided ongoing technical support to Dragon Oil in the development and funding of its offshore producing assets in the Cheleken Contract Area, including annual Reserves updates.

Azerbaijan: Review of Oilfields as an Acquisition Target

Working for a potential buyer, GaffneyCline undertook a comprehensive evaluation of two producing oilfields and one oil discovery located onshore Azerbaijan. This involved a detailed, integrated review of geological, geophysical, petrophysical, reservoir engineering and production data, a review of cost data and work programme and cost projections, and economic modelling.



For more information about GaffneyCline's integrated services, please contact your regional GaffneyCline office.

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bd@gaffneycline.com | www.gaffneycline.com | Follow us on LinkedIn

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